

A REVIEW OF CAUSES FOR THE RELATIVE UNEQUAL PARTICIPATION OF WOMEN IN SCIENCE, ENGINEERING AND TECHNOLOGY AND INITIATIVES

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Declaration

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Abstract

Current literature reveals that men and women do not participate in the science, engineering and technology (SET) sector on equal grounds – not qualitatively (access) or qualitatively (ease of participation). It is important that women have access to and actively participate in science; they make up more than half of the world's population and gender equality enhances a country's economic growth and competitiveness. Furthermore, the focus should extend further than advocating for equal access to SET to actively promoting increased participation by women. Women bring a distinctive quality to SET precisely because of their gender. They are able to increase overall SET participation numbers and positively contribute to the quality and agenda of science. This study used the pipeline theory and lifecycle approach as theoretical bases to investigate the causes for unequal participation and reviewed initiatives aimed at increasing and facilitating the participation of women in SET. Identified causes include unequal access, male-dominated nature of science, tensions of reconciling professional and private life, differences in recognition and reward, and lack of female representation in leadership. The primary methodology used was a documentary analysis study design, consisting primarily of desktop literature searches and categorization. An initiative summary framework was used to summarise and code 123 identified initiatives into an initiatives summary database. Findings were both positive and negative. The study found that women in many cases are on equal footing with their male counterparts and can manage a healthy work-life balance if provided with the necessary support but many women still describe a male-dominated work environment that is exclusionary. Findings indicate that, although decreasing, there is still gender bias in recognition and reward and that female scientists underutilise financial rewards. Women in SET do not receive equal pay for equal work and there is a distinct lack of female representation in SET leadership bodies such as academies of sciences, scientific boards and publication boards of academic journals. The most common modes of intervention are policy interventions, gender mainstreaming, advocacy and interest groups, and provision of training and support. The majority of initiatives are aimed at bringing about change at a national/policy level and are driven primarily by government and academia with academia playing an important middleman role - assisting and guiding government in the design and roll-out of policies on the one hand and meeting the human resource needs of industry on the other. Although government and academia have done well in driving initiatives that increase the participation of women in SET at both school and tertiary level, more needs to be done by industry to drive the facilitation of participation. There are very few initiatives addressing the retention of women in SET; this is linked to the lack of attention to returners as a specific target group. The study concludes that the majority of countries are succeeding in closing the participation gap in terms of access or horizontal gender equality, but that vertical segregation (focusing on recognition, reward and advancement), although acknowledged, remains a mostly unaddressed challenge.

Uittreksel

Huidige literatuur dui daarop dat vroue en mans nie gelyke deelname geniet in die Wetenskap, Ingenieurswese en Tegnologie nie – nie kwantitatief (toegang) of kwalitatief (gemak van deelname) nie. Die belangrikheid van deelname word gesket teen die kennis dat vroue die helfte van die wêreld se bevolking verteenwoordig en dat lande wat geslagsgelykheid nastreef oor die algemeen hoër ekonomiese groei en mededingenheid toon. Die fokus in die debat gaan dus nie meer net oor die reg tot toegang nie maar ook oor aktiewe en gemaklike deelname wat vroue toelaat om juis hul unieke eienskappe na die wetenskap te bring. Die studie het die pyplynteorie en 'n lewenssiklusbenadering as die teoretiese grondslag gebruik om die deelname van vroue in die terrein te bestudeer. Die navorsing het gepoog om die hoofoorsake vir die relatiewe ongelyke deelname van vroue in die Wetenskap, Ingenieurswese en Tegnologie te bepaal. Die hoofoorsake is geïdentifiseer as ongelyke toegang, die manlik-gedomineerde aard van wetenskap, die spanning om professionele en persoonlike lewe te versoen, verskille in erkenning en beloning; en die gebrek aan vroulike verteenwoordiging in leierskap. Verder wou die studie bepaal watter inisiatiewe in gebruik is vir die uitbreiding en vergemakliking van vroue se deelname in die veld. Die hoof metodologie was 'n dokumentêre analise studie ontwerp. 'n Inisiatief opsommingsraamwerk is gebruik om die 123 geïdentifiseerde inisiatiewe op te som en te kodeer en is saamgevat in 'n inisiatiewe opsommingdatabasis. Bevindinge was beide positief en negatief. Die studie het bevind dat vroue in baie gevalle gelyke toegang geniet en 'n gesonde balans tussen hul persoonlike en professionele lewe kan bestuur indien die nodige ondersteuning gebied word. Baie vroue beskryf egter nog steeds 'n manlik-gedomineerde werksomgewing. Hoewel die neiging dalend is, is daar nog steeds geslagsvooroordele in erkenning en beloning en vroulike wetenskaplikes maak nie genoegsaam gebruik van finansiële belonings wat wel tot hul beskikking is nie. Vroue ontvang ook nie gelyke betaling vir gelyke werk nie. Daar is 'n duidelike gebrek aan vroulike verteenwoordiging in leierskap soos aangedui in die samestelling van akademies van die wetenskap en die bestuursrade van wetenskaplike rade en publikasie rade van wetenskaplike vaktydskrifte. Die mees algemene vorme van intervensies is beleidsintervensies, geslagshoofstroming, voorspraak en belangegroep, en die verskaffing van opleiding en ondersteuning. Die meerderheid van inisiatiewe is daarop gemik om verandering teweeg te bring op nasionale en beleidsvlak en word hoofsaaklik gedryf deur die staat en die akademie. Die akademie speel dan ook 'n belangrike middelman rol deurdat hul aan die een kant die regering bystaan in die implementering van beleid en aan die anderkant ook die menslike hulpbron behoeftes van industrie moet voed. Daar is 'n leemte by die meerderheid van inisiatiewe in die aanspreek van die behoeftes van vroue wat wil terugkeer na die veld na 'n periode van afwesigheid en aan die retensie van vroulike wetenskaplikes. Die studie kom dus tot die gevolgtrekking dat die meerderheid van lande en inisiatiewe daarin slaag om meer gelyke deelname in terme van toegang of horisontale geslaggelykheid te bewerk, maar dat vertikale segregasie (met 'n fokus op erkenning, belang en bevordering), nog heelwat aandag moet geniet.

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List of Abbreviations

AAAS	American Association for the Advancement of Science
ARC	Agricultural Research Council
ARS	Agricultural Research Services
AWIS	Association for Women in Science
CEDAW	Convention for the Elimination of Discrimination against Women
CeSTII	Centre for Science, Technology and Innovation Indicators
CHE	Council for Higher Education
CREST	Centre for Research on Evaluation, Science and Technology
CSIR	Council for Scientific and Industrial Research
DCC	Dual Career Couples
DFG	German Research Foundation
DHET	Department of Higher Education and Training
DST	Department of Science and Technology
DTI	Department of Trade and Industry
EC	European Commission
EIRMA	European Industrial Research Management Association
ENWISE	Enlarge Women in Science to the East group
EPWS	European Platform of Women Scientists
ERA	European Research Area
ERC	European Research Council
ESPSRC	Engineering and Physical Sciences Research Council
ETAN	European Technology Assessment Working Group on Women and Science
EU	European Union
FAWE	Forum for African Women Educationalist
FAWESA	Forum for African Women Educationalist South Africa
FONDECY	Science and Technology Development Fund
GAP	Gender Action Plan
GFPs	Gender Focal Points
GCI	Glass Ceiling Index

HAS	Hungarian Academy of Science
HEFCE	Higher Education Funding Council for England
HR	Human Resource
HRD-SA	Human Resource Development Strategy for South Africa
HSRC	Human Sciences Research Council
ISWIST	Korean National Institute for Supporting Women in Science and Technology
IT	Information Technology
IUF	Institut Universitaire de France
KNAW	Royal Netherlands Academy of Arts and Sciences
MDGs	Millennium Development Goals
M&E	Monitoring and Evaluation
MRC	Medical Research Council
MST	Mathematics, Science and Technology Education
NACI	National Advisory Council on Innovation
NOW	Dutch National Research Council
NPO	Not-for-profit
NSF	National Science Foundation
NSI	National System of Innovation
OSW	Office of the Status of Women
OWSD	Organization for Women in Science for the Developing World
PAESMEM	Presidential Awards for Excellence in Science, Mathematics and Engineering
PICA	Principal Investigator Career Advancement Programme
PWSET	Promoting SET for Women Unit
R&D	Research and Experimental Development
RISA	Research and Innovation Support Agency
S&T	Science and Technology
SADC	Southern African Development Community
SCWIST	Society for Canadian Women in Science and Technology
SECT	Science, Engineering, Construction and Technology
SET	Science Engineering and Technology

SET4W	Science, Engineering and Technology for Women
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
THRIP	Technology and Human Resources for Industry Programme
UK	United Kingdom
UKRC	United Kingdom Resource Centre
US	United States
WEF	World Economic Forum
WEPAN	Women in Engineering Programs & Advocates Network
WES	Women's Engineering Society
WETSU	Association of Women Engineers, Technicians and Scientists
WIE	Women in Engineering
WIN	Women in Industry
WIRDEM	Women in Decision Making Expert Group
WISNET	Women in Science Equity Network
WITS	Women in Technology and Science
WOS	Women Scientists Scheme

CHAPTER 1**INTRODUCTION****1.1 BACKGROUND AND RATIONALE FOR THE STUDY**

At the time of starting my studies in social sciences research methodology, I was working at the Centre for Science, Technology and Innovation Indicators (CeSTII), a unit within the Human Sciences Research Council (HSRC) responsible for producing national figures and findings on research and development and innovation activities within South Africa. This was my first exposure to the broader field of Science and Technology (S&T) as I had previously worked within the not-for-profit (NPO) sector focusing mainly on monitoring and programme evaluation. So while learning about S&T at a rapid pace at CeSTII, I was also being exposed to the field in an indirect manner as my masters course was being offered by the Centre for Research on Evaluation, Science and Technology (CREST) that also undertakes research on S&T. Subsequently, I ended up working at CREST and almost ‘fell’ into the subject of ‘Women in Science Engineering and Technology’ (SET), as this would provide the focus of my first CREST assignment. I was responsible for producing a report for the Department of Science and Technology (DST) on women’s participation in SET within South Africa. The report was a reduced version, with updated statistics, of a previous publication produced by CREST in 2004 entitled *Women in Science, Engineering and Technology in South Africa*. As part of the first report, the lead researcher, Tracy Bailey, had compiled an initial and partial database of international interventions aimed at increasing the participation of women in SET. As far as I could establish, the database was included in the final report, but never again revisited by any particular body.

Partly due to my own curiosity and to the fact that I had to do some background reading to complete my assignment, I started reading more broadly on the subject and kept revisiting the database. When the time came to select a topic for my thesis, the prospect of updating and expanding the database seemed like a good option. Furthermore, I also sensed that this would create an opportunity to understand the debate around women in SET more clearly. The particular subject matter also resonated well with my previous work in the NPO sector that had exposed me to gender and empowerment issues.

When thinking about the term ‘science’ many people envision scientists conducting research in the so-called ‘hard sciences’ – science that is somewhat detached from everyday life. It is statements like the following that start to challenge one’s limited understanding and preconceived ideas about the scope and importance of science:

The place of research or scientific enquiry is fundamental and significant in the life of any nation. Research on any subject is the process whereby a people seeks information, analyses the information, reaches conclusions and uses such conclusions to act and/or make appropriate and informed decisions. Such informed decisions, which benefit mankind generally, should introduce more intelligent and relevant information that further improves and

expands knowledge and its applications in all spheres of human endeavour. Thus, research is the backbone of a nation's development and it is an indispensable tool for transformation, change and development.

(Williams, 2000:335)

It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening custom and tradition...of vast resources running to waste, of a rich country inhabited by starving people who indeed could afford to ignore science. At every turn we have to seek its aid...the future belongs to those who make friends with science.

(Pandit J. Nehru, Late Prime Minister of India in Williams, 2000:335)

Kornhauser (2000:34) takes the argument even further and brings in the gender perspective, stressing the important contribution both men and women can make to science and its resulting impact: *For turning population explosion into reproductive health; poverty and environmental degradation into sustainable human development; and violence into peace and cooperation. All the knowledge and creativity of both men and women in science are needed to bring about this change.*

Once I had gained some insight regarding the importance of science and the role of women within it, my literature search started focusing on the essential debate around the participation of women in SET. When I started reviewing the available literature it became clear that the term 'participation' is widely used but seldom clearly defined. In addition, the term 'women' is used very generically to include any person of the female sex, from birth to senior citizenship. I then started wondering how one would increase and facilitate the participation of women in SET, if it was not really clear as to what this participation entailed and secondly who these interventions were aimed at? It also became clear that these questions would have to be answered first in order to define the parameters of the study and they potentially could become the basis of the study – implying that one might have to first step backwards before being able to take a significant leap forward.

The literature proposes that dimensions of the research careers of women in SET be viewed using the *pipeline theory* – portraying the SET system as a pipeline and female careers in SET as moving through this pipeline. It also proposes that women's participation be reviewed using a *life-cycle/life-course approach* that includes women's participation in and experience of SET throughout all stages of their lives (Etzkowitz et al, 2000). The life-course that flows from earliest school experiences up to eventual employment in science is illustrated as this pipeline and the speed of flow into scientific careers is calculated by using transition points in the pipeline such as graduation, post-graduate studies and employment in SET. The literature indicates that the pipeline starts off with a rush of young female graduates and along the way loses some power due to certain leakages that result in limited representation of women in senior and governing positions within SET. It is proposed that, if one were able to identify these leakages and design initiatives to address them, the flow would

increase, representing an increased participation of women in SET. This would increase both access and ease of participation. The social context within which all of this takes place also needs to be considered as our concepts of gender, science and labour are defined largely by our culture and upbringing. From this, research questions started to emerge, firstly: *What are these 'leakages' or causes for the relative unequal participation of women in SET?* and secondly: *What is being done to address these leakages (or to increase and facilitate the participation of women in science)?*

In order to answer these questions the current state of women in SET needed further exploration. This exploration could potentially also establish whether the flow in the pipeline has increased at certain critical points, in other words, has there been any progress in increasing and easing the participation of women in SET? And if so, point to the causes that currently require more intervention.

As stated previously the term 'participation' is loosely used in describing the presence of women in science. The term, as it is relevant to this study, is defined more clearly in the next section. However the term is used it is clear from the literature that worldwide female scientists do not participate equally with their male counterparts in SET. It would seem that women and men work alongside each other in SET but seemingly experience and practice it rather differently. As *Chapter 2* will show there is evidence that women scientists do not participate across all scientific fields in proportion to their share of the population (particularly not in SET). Furthermore, they do not produce knowledge in proportion to their share of the population; are not accommodated in achieving a reasonable work-life balance; do not exercise the same influence and power in SET decision-making bodies as men do; and are not recognised and rewarded to the same degree as male scientists. For the purposes of this particular study, it was decided to categorise the main causes for the unequal participation of women in SET as (1) Unequal access to SET; (2) Male-dominated nature of science; (3) Tension of reconciling professional and private life; (4) Differences in reward and recognition; and (5) Lack of female representation in leadership. The lack of sex-disaggregated data and the issue of knowledge production are also highlighted by the literature, but will only be discussed as far as they relate to the above-mentioned main causes. These categories are briefly defined in the following section followed by a comprehensive overview in *Chapter 2*.

Defining 'Participation'

The Oxford Dictionary (www.oxforddictionaries.com) defines participation as '*the action of taking part in something*'. If applied to the participation of women in science it translates to *the action of women taking part in science*.

Long & Fox (1995: 47) offer the only formal definition of participation as 'to employment in science and engineering, with advanced degrees usually a prerequisite to employment'. However when reviewing all available literature it would seem that the term is used more generally to describe a number of activities performed by women in SET, measured primarily in quantitative measures (in

other words, how many women are present at various stages of the SET pipeline) and to a lesser degree quantitatively (value added and ease with which activity is performed).

For the purposes of the study, I propose expanding the definition of *participation* to include:

- Access to SET (access to scientific information, at school and tertiary level)
- Active engagement in the SET workplace (at all levels)
- Retention of women in SET careers
- Progression of women in SET careers

This definition seems to be closer to what Long & Fox (1995) describe as the ‘dimensions of career attainment of women in science’ which include participation, position, productivity and recognition. Position refers to placement and rank within an organisation and within this study is would be describe as the ‘progression of women in SET careers’ with the challenge linked to it being ‘the lack of female representation in leadership’. For Long & Fox productivity includes contributions to scientific knowledge as predominantly measured by publication output. Knowledge production within this study will only be discussed in terms of how it is traditionally measured and how this contributes to the male-dominated nature of science and its resulting gender bias. Recognition as defined by Long & Fox (1995:48) refers to the ‘acknowledgement by the scientific community for contributions and achievements’. For the purposes of this study this aspect speaks to the retention and progression of women in SET careers and is highlighted under the challenge of ‘differences in reward and recognition’.

The following table illustrates how participation is discussed as regards the various challenges:

Table 1.1: Participation and challenges

Causes of unequal participation	Relevant aspect of participation
Unequal access	Access
Male-dominated nature of science	Active engagement in SET (all levels) Retention of women in SET careers
Tension of reconciling professional and private life	Active engagement in SET (all levels) Retention of women in SET careers
Differences in reward and recognition	Retention of women in SET careers Progression of women in SET careers
Lack of female representation in leadership	Progression of women in SET careers

Defining 'Access'

As can be seen from the proposed definition, access is one element of participation. Access is defined by the Oxford Dictionary (www.oxforddictionaries.com) as *'the means or opportunity to approach or enter'*. If applied to women in science, it can be understood as the means or opportunity for women to approach or enter science. Some might argue that access is necessary before participation can take place; the literature indicates considerable overlap and interrelatedness in the use of these terms. One such example is that of Achmad (2000) who defines access to SET on a number of levels. These include access to information and knowledge on SET followed by access to education and training in SET that will enable the utilisation of SET. He includes the application of SET for growth and development, ensuring quality environments and finally access to opportunities to pursue a career in SET and at the highest level to be involved in SET decision-making. Achmad's description overlaps with the broader definition of participation and highlights the complexity and interrelatedness of these two terms. It is very much a 'chicken and egg' scenario: without access, there is no participation, but participation is needed in order to gain access to the next stage of the pipeline.

For the purposes of this study, the term 'access' will be used as it relates to:

- The initial opportunity young girls and women have to access science information
- The opportunity for studying SET with the aim of pursuing a career in science (at school, graduate and post-graduate level)

Chapter 2 provides a general overview of young girls' exposure to SET at pre-school and school-going age and how this influences their decision to pursue higher studies in SET and envision SET career possibilities. Much work is done internationally to expose young girls to the opportunities in SET and to challenge their gendered thinking about girls taking part in science. The largest part of the European Union (EU) and the United States (US) have made huge strides in assuring equal access for girls to SET subjects, but as the literature shows, much is still to be done, especially so on the African continent. *Chapter 2* also presents a broad range of statistics to indicate the access young women have to studying SET at tertiary level. It becomes clear, when looking at countries collectively and individually, that there is a rapid increase in the proportion of female graduates in all fields and, even at post-graduate level, women are gaining momentum. The current challenge in terms of access remains at doctoral and post-doctoral level.

To summarise, 'participation' will be used to discuss all aspects of the SET career pipeline, while 'access' will primarily focus on issues of initial opportunity to access SET knowledge at school and tertiary level. Issues of representation, progression and leadership will be discussed under the remaining causes of 'male-dominated nature of science', 'differences in recognition and reward' and 'lack of female representation in leadership'.

Defining 'Male-dominated nature of science'

Studies have documented increased representation of women in SET careers, but also that the opportunities are not always in line with their abilities. Even though women have steadily been gaining increased access to SET, the numbers start to drop the further one moves down the pipeline. In many cases men still dominate the majority of SET positions (especially so at senior levels) and for the women that have managed to rise up alongside their male colleagues it is not always a level playing field.

A number of authors (Smith Keller, Fox Keller, Brouns & Addis, Gupta et al) paint a picture of how women are expected to portray certain masculine qualities in order to succeed in a SET career and even at times have to 'outperform' their male colleagues to achieve the same recognition (often referred to as the 'male bonus'). Women are further hampered by the 'triple burden' encompassing the normal work stressors faced by both genders in unfavourable working conditions and the stress of maintaining a healthy work-life balance – but for women this also extends to include the isolation many women in SET describe as a form of subtle exclusion by their male peers from support, informal communication, collaboration and recognition (Gupta et al, 2004). Most often women address both the 'male bonus' and 'triple burden' effect by either adapting to the environment and becoming more 'masculine' in their work in order to be included and progress or, even worse, decide to leave SET for other fields or industries that are seen to be more accommodating to their female traits and needs.

Defining 'Tension of reconciling professional and private life'

Various studies (Lane, Etzkowitz, Haataja et al, Cole and Zuckerman and Bradley) indicate that traditionally women, as primary caregivers of their families, experience a role conflict between their domestic responsibilities as partners and parents, and their work as professional scientists. The majority of these studies then also relate the absence of women in SET to this work-life balance conflict – as women battle to manage this balancing act and most often reduce, pause or exit their participation in science. For those that seemingly 'succeed' in pursuing a scientific career it is often at the cost of choosing not to have a family or any domestic responsibilities. The one finding that stands out clearly in all studies is that successfully managing this reconciliation process requires additional resources and support.

Defining 'Differences in reward and recognition'

The Oxford Dictionary (www.oxforddictionaries.com) defines recognition as '*appreciation or acclaim for an achievement, service or ability*'. Reward is defined as: (1) *to give something to someone in recognition of their services, efforts or achievements*; (2) *show one's appreciation of an action or quality*; and (3) *to receive what one deserves*. Recognition seems to address more the emotive aspect of feeling acknowledged by one's leaders and peers while reward addresses the physical compensation one receives in relation to the value and quality of performance. These two concepts are also interlinked as reward is usually given as a direct result of recognition. Both professional men and women working in science desire and work towards recognition and reward. Recognition and

reward for excellence in science is displayed in salary distribution, access to funding, and in the awarding of fellowships and prestigious awards. Examples of the inequality in the distribution of salaries, funding, fellowships and awards between male and female scientists are numerous (Lane, Bailey et al, EC various publications). This does little to encourage younger women to pursue a career in SET and does nothing to motivate female scientists within the system to try to progress to the next levels in their scientific careers.

Defining 'Lack of female representation in leadership'

Gupta et al (2004) highlights the importance of female representation in key management and committee positions. Such positions allow highly skilled female scientists (1) the opportunity to display their skills at a level of impact, (2) to play a significant role in determining the science agenda and the allocation of research funds; and (3) assists in setting-up the necessary networking and advocacy platforms needed to drive gender issues. The lack of women in SET leadership positions is universal and well documented (EC various publications, Brouns & Addis, Palomba, Noordenbos, Sandström & Hällsten, Addis, Husu & Koskinen). This lack of leadership and adjoining representation is portrayed in the sex-disaggregated data of membership profiles of higher education institutions, academies of sciences, scientific boards and publication boards as highlighted in *Chapter 2*.

Over time, the debates and resulting interventions around addressing these main causes for the unequal participation of women in SET have shifted. Initially there was a huge drive to ensure the initial and increased access for women to SET at various levels - statistics indicate that this has been successful in a number of countries. It also becomes increasingly clear that where a country is ranked in terms of this progress will be in line with its broader democratic views and acknowledgement of the contribution women can make – see *Chapter 2* for further clarification on this point. Even the male-dominated nature of science and the tension of maintaining a healthy work-life balance are being addressed aggressively whether it be in the form of support for women to adjust to the situation or by challenging employers and decisionmakers to accommodate female scientists within their domain. The biggest gaps remain in addressing the differences in recognition and reward for men and women working in SET - either via status or financially and alongside this, addressing the lack of female representation in SET leadership and decision-making structures.

In answering the second question regarding which initiatives are in place to increase and facilitate the participation of women in SET, my initial reading revealed various initiatives focused on the participation of women. The challenge, however, is that the majority of these initiatives are not explicit about their goals, objectives and target groups. This led me to attempt structuring the collected data in the hope of finding a clearer picture of what these initiatives are really trying to achieve, for whom, and by which means.

1.2 DEFINITION OF TERMS

Throughout *Chapter 2*, a number of definitions are provided for the main terms used in the study. A short summary of some other main terms is provided at this stage in order to set the boundaries or parameters of the study.

Table 1.2: Definition of terms

Facilitating	Qualitative measure of participation (degree of comfort women experience in taking part in SET)
Gender	The state of being male or female (typically used with reference to social and cultural differences rather than biological ones) (www.oxforddictionaries.com)
Horizontal gender equality	Within this study the term is used to describe the even horizontal spread of both men and women working alongside each other at various levels within SET; whereas in popular SET literature horizontal gender equality is typically described as the equal distribution of women and men into different ranks (e.g. professional and supporting)
Increasing	Quantitative measure of participation (in access, active workforce, retention and progression)
Initiatives	All programmes, projects and interventions identifying women in SET as their primary target group irrespective of level of intervention or geographic location
Sectors	All sectors are covered in the study, although there is some bias towards the higher education and business sectors due to extensive coverage in the literature
SET	All scientific activities in the natural sciences, engineering and technology, medical and health sciences, agricultural sciences, social sciences and humanities – although the literature has a strong focus on women working in the natural sciences, engineering and technology, and health sciences
Vertical gender equality	Within this study the term is used to describe the even vertical spread of both men and women in SET as achieved through equal access to recognition, reward and opportunities for advancement; whereas in popular SET literature vertical gender equality is typically described as the equal distribution of men and women across the various research fields
Women	For purposes of the study the main focus is on students, entry-level scientists, established scientists and senior female scientists studying, promoting or working in SET

1.3 RESEARCH AIM AND OBJECTIVES

The current literature indicates that women and men do not experience participation in SET similarly. Taking the pipeline theory and the life-cycle approach as the theoretical bases of the study, the central aim was to identify the leakages in the SET pipeline and ways in which to address them. The study thus primarily aims to:

Firstly, determine what causes the relative unequal participation of women in SET: defined in terms of unequal access; male-dominated nature of science; tension of reconciling professional and private life; differences in recognition and reward; and the lack of female representation in leadership.

Secondly, review current initiatives aimed at increasing and easing the participation of women in SET (addressing the causes).

Although not the primary focus of the study, the secondary objectives of the study are to determine:

- What progress is being made in addressing these challenges; and
- Where the focus of interventions might need to shift in future?

1.4 RESEARCH DESIGN AND METHODOLOGY

In order to address the specific research questions, which comprise a broad and very vague field of study where terminology such as initiative, programme, projects, interventions, women, SET, and participation aren't always clearly defined, it was decided to use a documentary analysis study design as the main methodology, consisting primarily of desktop literature searches and categorisation.

A review of resources located within various relevant libraries was done in the initial stages of the research and based on these further online resources were consulted. A variety of websites were also consulted including government departments and agencies, not-for-profit organisations, and universities and university units working within the field of gender studies. All initiatives housed within the original database and new ones identified during the literature review were 'googled' to determine if specific websites existed for these programmes/projects. The initial literature review and scan of initiatives revealed that there are various initiatives focused on increasing and facilitating the participation of women in SET, but that the majority do not explicitly state their goals and objectives and specific target groups. It was decided therefore to design an 'initiative summary framework' and a data-capturing instrument in an effort to provide some structure for the capturing, analysis and reporting of the data. The decision regarding which initiatives to include in the final database was based on the volume of available online information for each, as well as the credibility of the source, and whether the majority of variables in the initiative summary framework could be populated to some degree of satisfaction. Each initiative was then summarised using the framework and then numerically coded and captured on an Excel spreadsheet using the data-capturing instrument.

Contingency tables and descriptive statistics were used for the bulk of analysis. The cleaned MS Excel dataset was used to create various contingency tables to cross tabulate the variables or, in other words, to summarise the relationship of one variable to another.

The data are interpreted by observing patterns and relationships in the various contingency tables in order to provide a more structured review of initiatives for women in SET. Data are interpreted with regard to (1) the geographic coverage; (2) the level of intervention; (3) the drivers of initiatives; (4) the various target groups; (5) the objectives and intended outcomes of initiatives; and (5) the type of initiatives and their core activities. The data are further interpreted in terms of addressing the particular causes for the unequal participation of women in SET namely unequal access; the male-

dominated nature of science; tension of work-life balance; differences in recognition and reward; and lack of female representation in leadership.

1.5 CHAPTER OUTLINE

The remainder of the thesis is divided into six chapters. *Chapter 2* provides a review of the literature on women in SET globally and particularly as it relates to the main causes for the relative unequal participation of women in SET. These causes are not investigated empirically but are presented as a literature review with some interpretation of existing data. *Chapter 3* presents a South African perspective of women working in SET.

Chapter 4 reports on what the study found regarding initiatives aimed at increasing and easing the participation of women in SET. The chapter gives a general overview of the most common levels and modes of interventions currently used in the field as they relate to policy formulation and implementation, gender mainstreaming, the role of advocacy and lobbying bodies, and the provision of training and support. A brief overview is also given of promising activities taking place in industry to increase and facilitate the participation of women in SET within the private sector.

Chapter 5 describes the research design and methodology of the study, including data collection and capturing, data analysis and data interpretation used.

Chapter 6 consists of the analysis of the initiatives database in relation to such variables as initiative goals and intended outcomes, type of initiatives and their core activities, level of intervention, drivers of interventions, and intended target groups. Some data is also presented on how these initiatives are linked to addressing the main causes for the relative unequal participation of women in SET as outlined and discussed in *Chapter 2*.

Chapter 7 concludes the study with a summary of the main findings, the potential contributions of the study, some recommendations for future intervention, and a few ideas for possible further research.

Chapter 7 is followed by the *Bibliography* and *Appendix A* and *Appendix B*, which provides a summary of all initiatives captured in the database.

CHAPTER 2

WOMEN IN SCIENCE, ENGINEERING AND TECHNOLOGY¹

2.1 INTRODUCTION

Why is women's role in society and participation in science, engineering and technology (SET) gaining increasing attention? Malcom (1999) reminds us that women make up more than half of the world's population as well as the majority of the poor. With the advancement of technology, poverty and segregation have increased dramatically. For example, the income ratio of the richest 20% of the world's population to the poorest 20% increased from 30:1 in 1960 to 75:1 in 2000. Seventy percent of this marginalised group is women (Hill, 2003). Hill also explains the concept of women being *doubly disadvantaged*: at the first level women in poverty, as well as men, share exclusion from access to technology and economic opportunities. The major challenges faced are the cost of such technology and the lack of infrastructure to support new technologies in poor societies. The double disadvantage ensues from the confines of local tradition and culture that often enclose women in the home and in traditional roles of subservience.

The Global Gender Gap Report assesses 134 countries on how equally they distribute resources and opportunities between men and women in the areas of economic participation, educational attainment, health and survival, and political empowerment. The smaller the gap, the more gender equal a country is rated. The report shows that there is a direct link between low gender gaps and high economic growth and competitiveness. The Nordic countries (Iceland, Norway, Finland and Sweden) are certainly leading the way in establishing gender equality, with countries such as Ireland, Switzerland, Spain, Germany and the United Kingdom (UK) following suit (WEF, 2010). Unfortunately, many others still have much to learn and address in this arena. The 2010 Global Gender Gap Report indicated that 96% of health gaps and even 93% of education gaps have closed since the publication of the previous report, but only 60% of economic gaps have closed. As Laura Tyson points out:

The Global Gender Gap Report demonstrates that closing the gender gap provides a basis for a prosperous and competitive society. Regardless of level of income, countries can choose to integrate gender equality and other social inclusion goals into their growth agenda – and have the potential to grow faster – or they can run the risk of undermining their competitive potential by not capitalizing fully on one-half of their human resources. The economic incentive for closing the gender gap in health, education, economic opportunity and political power is clear.

(Posted by Guy Dresser, 17 December 2010, www.weforum.org/issues/global-gender-gap)

Furthermore, women have certain talents and they play a primary role in family and community and therefore perform a crucial role in sustainable development. In many rural communities, women also seem to possess the majority of local traditional knowledge in areas such as agriculture,

¹ Please note that data used is based on the last published figures and may be dated in some instances.

environmental resource management and health. Shiva (2009) highlights various qualities of women's traditional knowledge confirming its value for the future. In general, this type of knowledge is found to be holistic in nature; focused on improvement for the common good rather than private gain; it is rooted in diversity and collective effort; and its application is usually of a long-term and sustainable nature.

There is also the interesting phenomenon of women and men both working alongside each other in SET but seemingly experiencing and practicing it so differently. As Hundleby (2012:28) explains: *Feminist demands for attention to women's experiences suggest that empiricism can be a promising resource for developing a feminist account of knowledge. Yet feminists also value empiricism's purchase on science and the empiricist view that knowers' abilities depend on their experiences and their experiential histories, including socialization and psychological development.* Feminist empiricism advocates that besides just pushing for equal access when it comes to science, women no longer only need to practice science in the traditional value-neutral male manner, but that they bring something unique to the field of science precisely because of their gender and not because they aim to immolate their male colleagues (Harding, 1992). Harding believes that this would imply that women not only have the ability to quantifiably increase the number of scientists, but also have the potential to bring changes to the content and logic of science.

In order to understand the under-representation of women in the sciences, a perspective of the research career of women in science needs to be outlined combining the pipeline theory and life-cycle/life-course approach (Etzkowitz, Kemelgor & Uzzi, 2000). This picture is also presented against the context of feminist theories. As Richardson (2008:9) explains, *the main concern in feminist theories of gender is not simply to describe the ways in which gender is socially and culturally defined in any given society. It is to develop understanding of how gender is connected to social, economic and cultural status and power in society. In this sense, gender is theorised not as difference but as a social division, that is, in order to illuminate how the social reproduction of gender difference is connected to gender inequality.*

The pipeline theory suggests that the career pipeline of women in science should be examined as a means of identifying weaknesses in the science system as a whole, together with strategies for addressing the underparticipation of women. This also includes using a life-cycle/life-course approach that proposes we view women's participation in and experience of SET throughout all stages of their lives – gender analysis of women/girls through school, higher education and into professional practice, taking into consideration other life-cycle aspects, for example, child-rearing (Etzkowitz et al, 2000). This life-course flows from earliest school experiences up to eventual employment in science and is illustrated as a pipeline transporting fluids, gas, etc. The speed of flow into scientific careers is calculated by using transition points in the pipeline such as graduation, post-graduate studies and employment in SET. The pipeline seemingly starts off with a forceful rush of young female graduates and along the way it seems to lose its power due to leakages, and in the end is left with only a dribble,

symbolising the few female scientists that have somehow sidestepped the leakages and are placed within prominent positions in science.

If these leakages can be identified and initiatives put in place to address them, the flow would potentially increase – not just quantitatively but also qualitatively. The image of a pipeline also indicates the restrictive nature of a career in science – implying that there is only one way of ‘passing’ through the system and with each stage of progress the pipe becomes narrower excluding those that have ‘leaked out’ or not ‘played’ within the boundaries of the system. This also highlights the shortcomings of the supply side theory that proposes that by encouraging an increased number of young girls to study science the presence of both genders in science will equalise over time. Statistics do support this thesis up to a point as the figures for female science graduates have increased dramatically over the past decade, but when it comes to post-graduate level and formal employment, the leakages become evident and this argument also needs to consider the demand side. In other words what are organisations and society at large doing to keep these women in science and to ensure that they reach their full potential (Etzkowitz et al, 2000).

Social context theory is also relevant to our discussion. Bradley (2007) refers to two discourses that support the gender divide in labour. The first is the male breadwinner ideology that basically holds the male as the primary financial provider of the household who should therefore ‘go out’ and earn a living in the competitive market place, while the female role is that of supporter taking full responsibility for domestic chores and childrearing. Although many households are now dual-income households with both partners working, this is mostly due to economic pressures and not so much due to a real shift in perspectives around the roles and responsibilities of the sexes. The working mother will try to arrange her work around her domestic responsibilities whereas life for most men will continue as before they got married and had children.

The second discourse is one of masculinity, femininity and ‘fit work’. This discourse states that certain types of employment are more suited to each of the genders and that working on either side of the spectrum would put one at the risk of having to adjust one’s masculinity or femininity in order to be effective and efficient. These discourses are also then transferred and maintained at both interactive and institutional levels. From an early age, boys and girls subconsciously learn what is seen as being appropriate for each sex from what they observe around them via role models, schooling, media etc. This is often not even transferred deliberately but often due to a lack of exposure to other options or examples. These young men and women then grow up and make gendered career decisions, enter highly gendered workplaces and perpetuate that which is seen to be the norm.

This brings us to the main questions of the study: Firstly, what are the ‘leakages’ or causes for the relative unequal participation of women in SET? Secondly, what is being done to try addressing these leakages or challenges? This chapter aims to answer the first question: what are the main causes for the relative unequal participation of women in SET, from a global perspective.

To start and define the boundaries of the study, some parameters for what is meant by 'women working in SET' are laid out. The Frascati Manual (2002), the guide for proposed standard practice for surveys measuring Research and Experimental Development (R&D) worldwide, defines S&T as all scientific activities in the natural sciences, engineering and technology, medical and health sciences, agricultural sciences and humanities. The focus of women's participation in SET will then include women scientists working in all fields of science. Cognisance does however need to be taken of the fact that most of the literature has a strong focus on women working in the natural sciences, engineering and technology and health sciences and that this is generally what is perceived as the domain of SET. The manual also lists the sectors where these scientists are active and includes the business sector, government sector, higher education sector, not-for-profit sector and science councils. Once again, there is a slight bias in that the highest volume of data is available for the higher education sector. When taking the Frascati definition of R&D workforce into account we can group these women to include all female researchers, technicians and other personnel directly supporting R&D.

2.2 MAIN CAUSES FOR RELATIVE UNEQUAL PARTICIPATION OF WOMEN IN SET

Since the late 1980s there has been a steady increase in studies on the presence of women in SET (Brouns & Addis, 2004); the main objective being to enhance the understanding of the multifaceted relationships between organisational cultures and practices and the personal preferences of the genders in an attempt to explain the under-representation of women in the sciences. Bailey et al (2004) summarises the main challenges that all countries face in relation to women in SET:

- The lack of reliable and complete sex-disaggregated data;
- Girls having less access to primary education thus widening the gap between genders at the secondary and tertiary levels;
- The male-dominated nature of SET;
- Discrimination in the workplace leading to limited funding for women and fewer senior positions; and
- The challenge of returning to the field after a break in their careers (usually due to family responsibilities)

These findings were echoed by the title and contents of the paper, "Waste of talents: turning private struggles into a public issue" (EC, 2003a:14) that: *highlights the long-standing perception throughout the Enwise countries, perpetuated and tolerated by the society at large, that the precondition of being a female scientist comes with the acceptance of an under-funded position in the scientific community, a double burden of maintaining a healthy work-life balance and the implicit expectation that all of these hindrances form part of the private sphere without any public recognition of remedy.*

To elaborate on these general observations the following section provides a discussion of the main causes for the relative unequal participation of women in SET categorised as: (1) Unequal access to

SET, (2) Male-dominated nature of science, (3) Tension of reconciling professional and private life, (4) Differences in reward and recognition; and (5) Lack of female representation in leadership. These categories are not mutually exclusive and overlap does occur.

There are also two other areas that are highlighted in the literature (lack of sex-disaggregated data and knowledge production) that fall somewhat outside the scope of this study and are therefore addressed only as far as they pertain to the above-mentioned categories and not discussed in any particular detail.

One of the first challenges that emerged when the debate around the participation of women initially entered the policy and academic arena was the lack of available sex-disaggregated data. Advocates as well as policy- and decision makers soon realised that participation, and then along with this access, could not be measured in quantifiable terms without the necessary data. *Statistics are central, the word comes from 'numbers for the state', if you wish to have policy, you have to have competent statistics. No statistics, no problem, no policy. You just get gestures. Statistics help identify problems and can monitor the effectiveness of remedies* (Dr. Hilary Rose, Emeritus Professor, University of Bradford, UK, She Figures 2003:15). As this quote illustrates, it is by measuring and monitoring the quantity of women in SET that advocates can take the first step towards motivating for change. This is where the importance of sex-disaggregated data bears relevance as it is only with such data being available that policymakers and programme designers can paint an accurate picture of the true situation of women in SET.

Many of the early interventions also focused at this level of impressing on governments, institutions and communities the importance of keeping such data in order to make a case. There has been much success in this area with national structures now in place to provide such figures on a regular and reliable basis. More reference will be made to these particular initiatives in the latter part of the study. It is also evident from this section of the study that EU and the US have lead the way in putting these policies and systems in place and therefore have the relevant data at hand. Nowhere else is the data so accurate and country specific as in the European Community and therefore this section of the study will display some bias towards Europe. Where possible some statistics are provided for other regions.

It must be noted that the literature further indicates that countries that are seen to be more democratic in nature and that place a high premium on gender equality are also the countries that have taken the lead in promoting the participation of women in science and for this reason feature more strongly in the literature. A recent report by the EC (2009c) grouped the EU-27 and six associated countries (Croatia, Iceland, Israel, Norway, Switzerland and Turkey) into a grouping of proactive countries, known for actively promoting and monitoring gender equality in research; and inactive countries, which have displayed very little interest and action regarding the promotion of women in research. The proactive countries were then further divided into the 'global gender equality leaders' including

Finland, Norway and Sweden, which have actively been pursuing gender equality in research since the late 1970s, later joined by Denmark and Iceland. Following closely behind this grouping is the 'active more recently' countries, which have been forced to make strides in this area as they have the largest portion of gender inequality in research in Europe and include Austria, Germany, Switzerland, Netherlands and Belgian Flanders. The third group of proactive countries include the UK, Ireland and Spain, where women traditionally have had a stronger presence in research. The inactive countries included Lithuania, France, Bulgaria, Estonia, Portugal, Poland, Hungary, Slovak Republic, Luxembourg, Romania, Greece, Turkey, Slovenia, Israel, Italy, Czech Republic, Cyprus and Malta. As could be expected, the proactive countries are also those countries that in general have more gender liberal cultures and vice versa. Although there is variation in implementation, all of the 33 countries have gender equality legislation in place.

An interesting trend is emerging in Europe regarding the age distribution of women working in SET. This trend is also a strong indicator of how progressive certain countries are in addressing the increased participation of women in SET and how this determines their focus on particular transition points and challenges within the SET pipeline. Meri (2008) points to the ageing of the female SET workforce in the north of Europe compared to the younger grouping of women working in SET in the south of Europe. In 2006, countries such as Malta, Cyprus and Greece all reported that more than 42% of young women working in SET in these countries were between 25 and 34 years of age. After lagging behind for many years, this potentially points to the increased awareness and interest in women in SET occupations in these parts of Europe. On the other side of the continent are countries such as Bulgaria with 45% and Sweden with 46% of all women working in SET aged between 45 and 64. Iceland, Finland and Estonia also indicated the majority of their female SET workforce to be within this age category. These countries have been known to be more progressive regarding gender equality and the focus towards the north of Europe is possibly due to the retention of the female SET workforce rather than access to careers in SET.

As indicated in *Chapter 1* the term participation is used generally to describe a number of activities performed by women in SET, measured primarily in quantitative measures (in other words how many women are present at various stages of the SET pipeline) and to a lesser degree qualitatively (value added and ease with which activity is performed). For the purposes of the study, I propose expanding the definition of *participation* to include:

- Access to SET (access to scientific information, at school, tertiary level)
- Active engagement in the SET workplace (at all levels)
- Retention of women in SET careers
- Progression of women in SET careers

Table 1.1 serves to illustrate how participation is discussed with regard to the various challenges.

2.2.1 Unequal access to SET

This section will firstly provide a broad description of 'access to SET', followed by a discussion of the various levels of access. At the first level, the focus is on access to scientific information as measured by the access young girls have to primary education and science subjects and how this is influenced by the cultural context and early socialisation girls and boys are exposed to. The next level focuses on access to higher education and is described in terms of female proportions in overall enrolment and graduation figures, doctoral graduates and SET enrolment and graduation figures at first degree and post-graduate level.

Achmad (2000) defines access to SET on a number of levels. These range from access to information and knowledge on SET; then access to education and training in SET that will enable the utilisation of SET; the application of SET for growth and development and ensuring quality environments; finally also access to opportunities to pursue a career in SET and at the highest level to be involved in SET decision-making. For the purposes of this study the term access will be discussed as it relates to the initial opportunity young girls and women have to access scientific information and the opportunity for studying SET with the aim of pursuing a career in science (at school, graduate and post-graduate level).

Unequal access to scientific information²

At the first level, access relates to the initial opportunity young girls and women have to access scientific information. This is traditionally measured by the number of schoolgirls that have access to primary education and science subjects. These numbers are, however, the result of a much earlier socialisation process that determines the legal right to such access and the motivation young girls receive to pursue such access within their cultural context. A recent report by Oxfam, indicated that girls in Africa receive on average 2.82 years of schooling and that only 46% of enrolled schoolgirls in sub-Saharan Africa ever complete their primary education – showing that access already becomes an issue at an early stage of development (Ringrose & Epstein, 2008). Of the 130 million African youth that are currently not in school, 70% are girls. For those that are in school the quality of education they receive also differs substantially between the genders (WEF, 2010). Also, out of 134 countries only 22 have no gender gap for access to education for males and females (WEF, 2010). Although the focus of the study is not on access to education, in general, this is the first point of entry for any boy or girl, to establishing what might one day become their income-generating and community-contributing occupations. The Global Gender Gap Report (2010) highlights that research continuously demonstrates that an investment in girl's education has a multitude of returns for developing economies such as a drop in fertility rates, lower infant and child mortality rates, an increase in labour force participation and earning rates, and a general improvement in quality of life.

² Access to scientific information at secondary school-level has been omitted from 'access to education' as it is not the primary focus of the study and the scope of the study is limited, and further due to the lack of internationally comparable data.

Haataja et al (2006) highlights the challenge posed by boys and girls being guided at an early stage in their socialisation and schooling towards more gender 'traditional' interests and careers – the norm being girls towards humanity and social issues and boys towards the natural sciences and technology. The effect of this being that both genders rarely end up working in sectors that are seen to be non-traditional for their gender. Even in progressive countries such as Finland, only about 20% of students and employees in the field of technology are women, and in social and health care women make up 90% of the student and workforce (Haataja et al, 2006). Gupta et al (2004) also reflects on a progressive nation such as the US where for many parts certain stereotypes are still reinforced by teachers and authority figures regarding traditional roles for girls and boys when it comes to subject and career selection.

An interesting example of how this socialisation takes form and extends into further education and training is that of India where science is considered a male enterprise and families are directly involved in the educational choices of young women. As a result, the majority of families are less willing to provide family resources to further the academic aspirations of daughters compared to that of sons. Most parents on moral grounds are also not comfortable with the idea of allowing their daughters to travel far distances and to stay at predominately male learning institutions (Gupta et al, 2004). If such an investment were to be made, it would traditionally not be seen as a wise one as it is felt that when daughters marry only the 'new family' will benefit from her status and income (Gupta et al, 2004). In Turkey, the strong influence of history and culture on the careers of women in science is interesting (Etzkowitz & Kemelgor, 2001). From the 1920s onwards, there have not been enough upper-class men to fill the large numbers of professional positions required by the newfound modern state. The result of this was that many technical fields opened to upper-class women, who were typically encouraged by their fathers to pursue careers. The ideology of modernisation together with a traditional support structure that provided childcare increased the chances of upper-class women entering science. However, as is the case with so many other countries, despite the high levels of participation of female scientists in Turkey, they face the same challenge of gaining success at the cost of a personal and family life.

Unequal access to tertiary education

The profile of a nation's graduate population is generally used to sketch a picture of the potential highly qualified workforce and development potential for the future (EC, 2003a). When looking at countries collectively and individually it is interesting to note that there seems to be a rapid increase in the portion of female student enrolments and graduation in all fields. So, in terms of equal access to higher education, some substantial progress is being made. Even at the level of post-graduate studies, women are slowly but surely starting to gain momentum. It does seem however that the biggest challenge in terms of unequal access still remains at doctoral and post-doctoral level, although the statistics do indicate growth in some regions.

Female enrolments

She Figures (EC, 2009a) indicates that in 2006 the proportion of female students in Europe (EU-27) overtook that of men to 55%. As *Table 2.1* indicates, the Czech Republic and Slovakia have increased their proportion of female student enrolments substantially. Estonia, Latvia, Sweden, Iceland and Norway all have more than 60% female representation among their student populations. The only two countries that recorded a decline in their proportion of female tertiary students are Cyprus and Portugal.

Table 2.1: Proportion of female tertiary students (2001, 2006, 2009)

	2001	2006	2009
EU -27	53,9	55,1	55,7
Belgium	52,8	54,7	54,8
Bulgaria	56,3	53,5	55,6
Czech Republic	50,1	53,8	56,5
Denmark	56,5	57,4	58,2
Germany	48,7	49,7	51,4
Estonia	60,1	61,6	61,9
Ireland	54,7	55,1	53,9
Greece	-	50,9	-
Spain	52,5	53,9	54,1
France	-	55,3	55,2
Italy	56,0	56,9	57,7
Cyprus	58,0	50,9	46,8
Latvia	61,8	63,3	63,7
Lithuania	59,8	59,9	59,2
Hungary	54,8	58,5	56,8
Malta	54,8	57,0	56,5
Netherlands	50,5	51,3	51,8
Austria	50,4	53,8	53,2
Poland	58,0	57,4	57,9
Portugal	57,0	55,2	53,4
Romania	53,5	55,4	56,3
Slovenia	56,1	58,4	58,0
Slovakia	51,3	57,7	60,5
Finland	53,9	53,9	54,0
Sweden	59,1	59,6	60,1
United Kingdom	54,5	57,3	57,0
Iceland	62,7	64,3	64,3
Liechtenstein	-	30,3	31,7
Norway	59,2	59,7	61,1
Switzerland	-	46,9	49,7
Croatia	-	54,1	55,0

Turkey	40,5	42,4	43,6
Albania	61,4	58,4	-
United States	55,9	57,4	57,1
Japan	44,9	45,7	45,8

(Source: Eurostats educ_enr15)

Female graduates

In terms of female graduates, the EU-27 is moving toward the 50% representation target, although at a slow pace. This is evident from *Table 2.2*, which shows that the proportion of female graduates for the EU-27 has remained at an average of 45% over the past ten years. Denmark, Portugal, Croatia, Finland and Ireland have managed to cross the 50% female representation mark. Ireland has made remarkable progress and has managed to increase the proportion of female graduates from 53% in 2001 to 62% in 2009. Somewhat worrying is the decline in the proportion of female graduates for countries such as Japan, Germany, Spain, Poland, Slovenia, Norway and even Sweden. For Latin America, the Middle East, North Africa, Asia and the Pacific female enrolment figures at tertiary level are also gradually increasing. Worrying though, is that this is only the truth for limited countries in sub-Saharan Africa, where the majority of girls are still excluded from secondary and tertiary education (WEF, 2010).

Table 2.2: Proportion of female graduates (2001, 2006, 2009)

	2001	2006	2009
EU-27	45,9	45,7	45,5
Belgium	52,4	51,0	53,7
Bulgaria	37,2	41,4	42,7
Czech Republic	47,6	46,9	47,2
Denmark	54,5	53,7	51,1
Germany	48,3	46,1	43,1
Estonia	33,6	34,1	32,8
Ireland	52,7	64,7	62,0
Spain	53,8	52,3	49,8
France	-	47,4	48,4
Italy	43,9	43,7	42,5
Cyprus	18,5	19,2	15,5
Latvia	38,9	39,3	40,7
Lithuania	39,5	37,7	37,5
Luxembourg	-	46,2	47,7
Hungary	45,1	38,5	38,5
Malta	-	45,1	42,5
Netherlands	48,3	49,9	49,3
Austria	38,3	-	41,9
Poland	41,4	36,2	37,3
Portugal	-	-	52,9

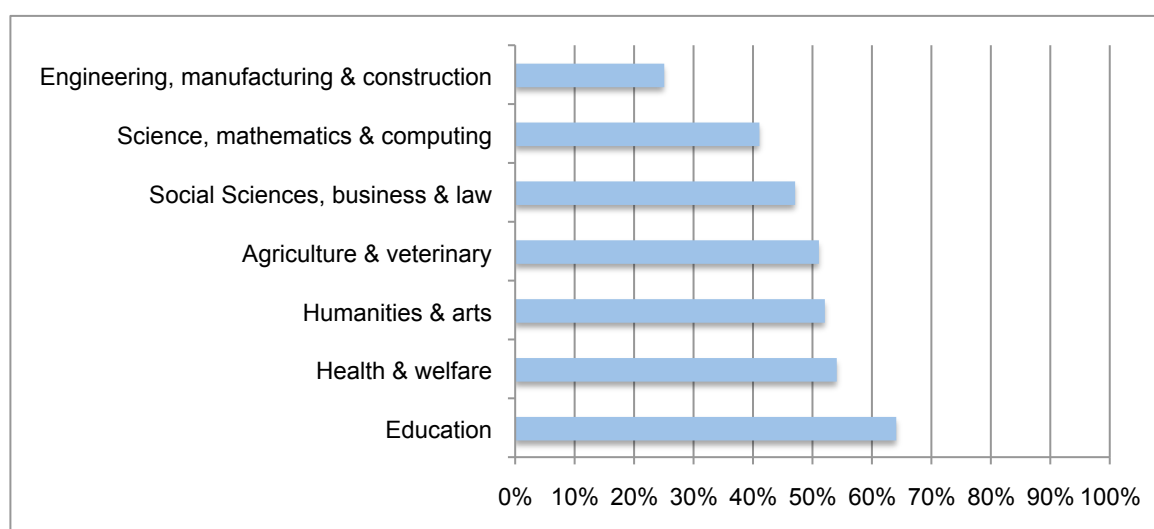
Romania	41,2	42,1	42,0
Slovenia	49,8	48,5	45,5
Slovakia	47,0	46,1	47,1
Finland	54,4	53,6	51,3
Sweden	47,4	47,0	45,6
Iceland	42,3	46,4	43,9
Liechtenstein	-	40,3	-
Norway	42,1	46,4	38,6
Switzerland	-	47,2	45,3
Croatia	-	46,0	50,1
Turkey	-	39,7	47,6
Albania	36,6	35,3	-
Japan	50,0	43,4	43,6
United Kingdom	39,5	43,3	
United States		48,9	54,7*

(Source: Eurostats educ_enr15, She Figures 2003, She Figures 2006) (*2008 – NSF, 2011)

Female PhD graduates

In 2006, on average 45% of all PhD graduates in the EU-27 were women. For the EU-27, in all fields the number of female PhD graduates has increased much more rapidly than the number of male PhD graduates with female PhD graduates increasing at a rate of 6.8% per year compared with 3.2% for male PhD graduates for the 2002-2006 period. Particularly high growth rates were reported for the same period in computing (13%), mathematics and statistics (12%), engineering and related trades (11%) and architecture and related trades (11%) (EC, 2009a). *Figure 2.1* however indicates that fields associated with SET (engineering, manufacturing and construction; science, mathematics and computing) still have the smallest proportion of female PhDs graduates among all female PhD graduates.

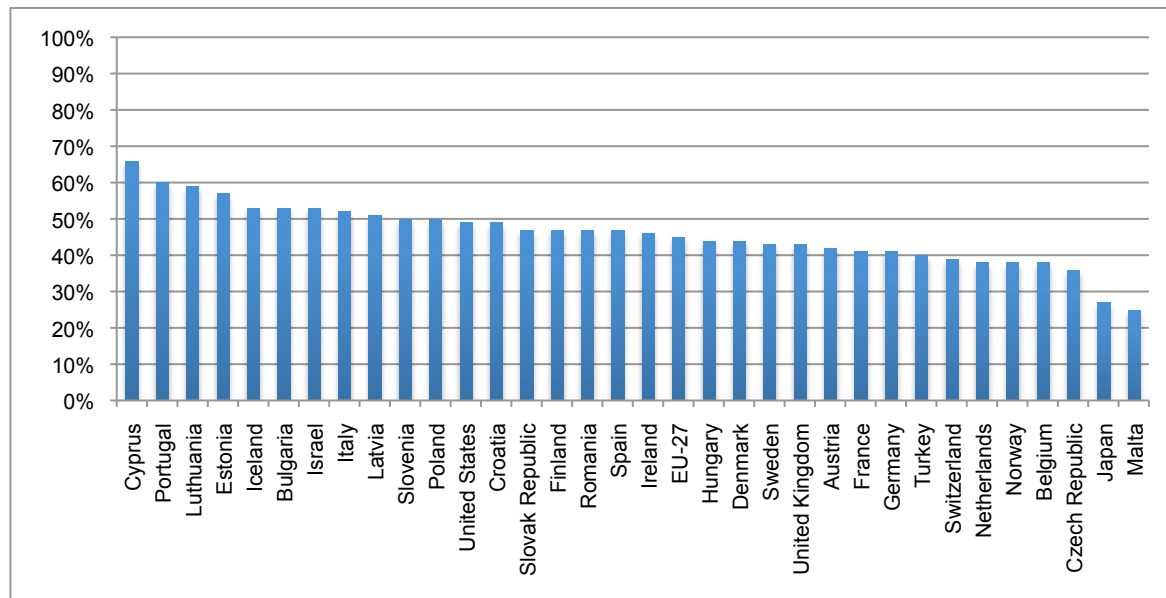
Figure 2.1: Proportion of female PhD graduates by broad field of study for the EU-27 (2006)



(Source: She Figure, 2006)

Cyprus, Portugal, Lithuania, Estonia, Iceland, Bulgaria, Israel, Italy, Latvia, Slovenia and Poland are countries that have more than 50% female representation in PhD graduates. A number of other countries are steadily reaching this target, with a few countries lagging behind considerably such as Japan, Malta, and the Czech Republic and, rather surprisingly, Norway, Belgium, the Netherlands and Switzerland.

Figure 2.2: Proportion of female PhD graduates for the EU-27 by country (2006)



(Source: She Figure, 2006)

Female graduates in SET

Looking at graduates in SET, a report by the US's National Science Foundation (NSF, 2010) indicates how women are gradually closing the gender gap. In 1998 there were 52 000 female graduates in the EU-27 (59% of all SET graduates) and by 2009 the figure increased to 94 000 (66% of all SET graduates) for the population aged 20-29 years. Comparatively in 1998 there were 55 000 female SET graduates in the US (also 59% of all SET graduates) and by 2009 the figure increased to 65 000 (63% of all SET graduates). Countries that have shown a substantial growth in the number of female SET graduates between 1998 and 2009 include Czech Republic (21 000 to 98 000), Denmark (51 000 to 112 000), Lithuania (69 000 to 114 000), Romania (29 000 to 149 000) and Slovakia (25 000 to 125 000). Interestingly the countries with the highest portion of female SET graduates in 2009 were Estonia (80%), Portugal (75%) and Denmark (74%), and the countries that are seemingly very progressive in terms of gender equality have stagnated somewhat with Finland at 59%, the UK at 63% and Sweden at 67%. The case of Ireland is also interesting as it had the highest number of female graduates in 1998 (15 000) but this number declined to 10 500 by 2009. France and Switzerland also boast some of the highest SET graduate figures worldwide and yet neither country has produced as many female graduates as some of their peers (France at 57% and Switzerland at 30% in 2009).

Table 2.3: Graduates in Science and Technology per 1000 of population aged 20-29 years

(Total population and female graduates) (1998, 2009)

	1998			2009		
	F	Total	F%	F	Total	F%
EU-27	5.2	8.8	59.1%	9.4	14.3	65.7%
Belgium*	4.9	9.7	50.5%	6.6	12	55.0%
Bulgaria	5.1	5.5	92.7%	7.8	10.1	77.2%
Czech republic	2.1	4.6	45.7%	9.8	15.3	64.1%
Denmark	5.1	8.1	63.0%	11.2	15.2	73.7%
Germany	3.5	8.8	39.8%	8.6	13.5	63.7%
Estonia	1.9	3.3	57.6%	8.7	10.8	80.6%
Ireland	15.8	22.9	69.0%	10.5	17.2	61.0%
Greece**	-	-	-	9.8	11.2	87.5%
Spain	5.3	8	66.3%	7.8	12.5	62.4%
France	11.6	18.5	62.7%	11.5	20.2	56.9%
Italy**	3.9	5.1	76.5%	9	11.3	79.6%
Cyprus*	2.8	3.4	82.4%	3.4	4.6	73.9%
Latvia	4.1	6.1	67.2%	6.3	9.8	64.3%
Lithuania	6.9	9.3	74.2%	11.4	18.5	61.6%
Hungary	3	5	60.0%	4.4	7.5	58.7%
Malta	0.4	1.3	30.8%	4.5	7	64.3%
Netherlands	2.1	6	35.0%	3.6	8.9	40.4%
Austria	2.7	7.9	34.2%	6.8	14	48.6%
Poland	3.2	4.9	65.3%	11	14.3	76.9%
Portugal	4.1	5.2	78.8%	10.8	14.6	74.0%
Romania	2.9	4.2	69.0%	14.9	20	74.5%
Slovenia	4	8	50.0%	6	11.3	53.1%
Slovakia	2.5	4.3	58.1%	12.5	17.5	71.4%
Finland	7.8	15.9	49.1%	11.3	19	59.5%
Sweden	4.2	7.9	53.2%	8.7	13	66.9%
United Kingdom	9	15.5	58.1%	11	17.5	62.9%
Iceland	3.8	7	54.3%	7.8	10.3	75.7%
Norway	4.1	7.5	54.7%	5.5	9	61.1%
Switzerland	-	-	-	7.1	18.1	39.2%
Croatia	-	-	-	8.9	12.8	69.5%
Turkey*	2.6	4.4	59.1%	4.9	8	61.3%
United States	5.5	9.2	59.8%	6.5	10.3	63.1%
Japan	3.1	12.3	25.2%	4.1	14.2	28.9%

(Source: NSF, 2010)

Detailed figures are unfortunately not available for all countries for the stated period, but it is believed that the US does reflect a relative representative picture for many other countries when it comes to

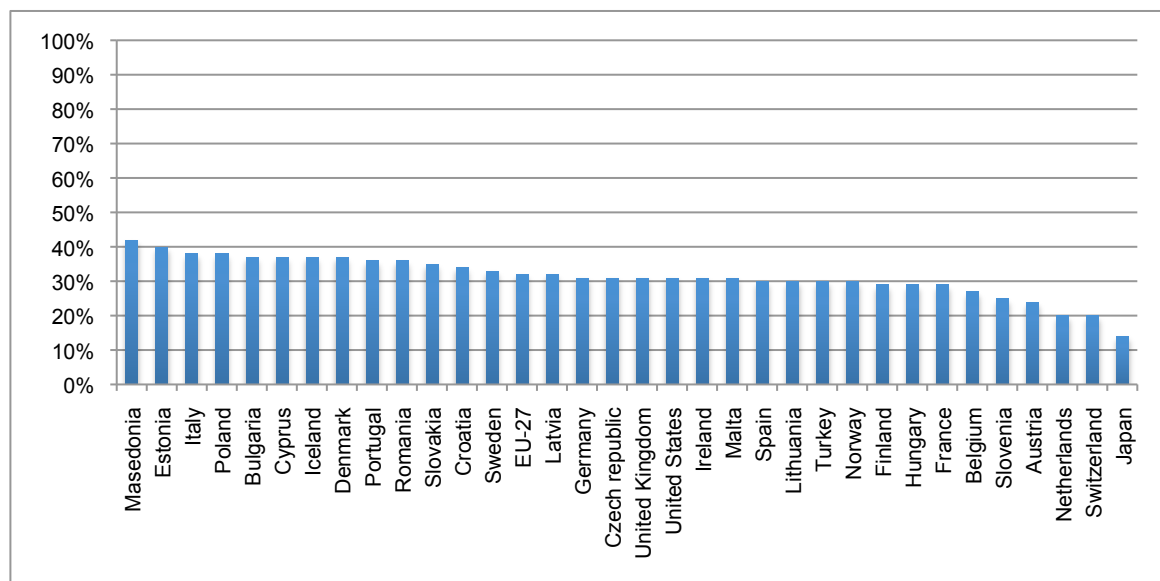
the tapering down of female graduate numbers as they progress down the pipeline. In 2008 in the US, women comprised 57.4% of all bachelor degree holders, 60.6% of all master's degree holders and only 46.1% of all doctoral degree holders. These percentages do seem promising when compared to 1966 figures when women represented 42.6% of bachelor degrees, 33.8% of master degrees and only 11.6% of doctoral degrees awarded in the US. Data for the portion of female SET degrees look promising with SET bachelor's degrees (from 24.8% in 1966 to 50.3% in 2009), SET master degrees (from 13.3% in 1966 to 45.8% in 2009) and even for doctoral degrees (from 8% in 1966 to 39.5% in 2009). The NSF also compiles data on women, minorities and persons with disabilities working in SET (NSF, 2011). The segment of full-time, full professorships held by women has risen from below 5% in 1979 to just over 20% in 2008. As in most other countries, the smallest portion of female graduates are in engineering and computer sciences this portion has shown an increase and especially so at master's and doctoral levels. A point of interest is that the number of female computer science graduates at bachelor's level has declined over the 20-year period, but the number of female doctoral graduates in this field has increased rapidly.

Table 2.4: Graduates in all fields of study and science and engineering graduates, by degree and sex for the US (1966, 1986, 2008)

Graduates in all fields of study									
	Bachelors			Masters			Doctorate		
	M	F	% F	M	F	%F	M	F	%F
1966	301037	222971	42.6	93184	47588	33.8	15863	2086	11.6
1986	490143	510061	51.0	143932	145897	50.3	20592	11305	35.4
2008	673666	906370	57.4	248944	382664	60.6	26271	22496	46.1
Science and engineering graduates									
1966	138679	45634	24.8	35580	5469	13.3	10646	924	8.0
1986	204743	130662	39.0	48621	23219	32.2	14268	5167	26.6
2008	246014	248613	50.3	67600	57154	45.8	19845	12959	39.5

(Source: NSF, 2010)

It is fascinating that countries like Macedonia, Estonia, Italy, Poland, Bulgaria, Cyprus and Iceland are producing the largest proportion of female SET graduates, compared to progressive countries traditionally associated with progressive SET sectors and gender equity practices (*Figure 2.3*) such as Japan, Switzerland, the Netherlands, France, Norway and even Finland. A possible explanation for this trend is the relative size of the science system in these countries. The science system is generally smaller in countries such as Macedonia, Estonia, Italy, Poland, Bulgaria and Iceland resulting in steady growth in comparison to the more established science sectors found in Japan, Switzerland, the Netherlands, France, Norway and Finland. Subsequently, the labour market in these smaller growing science sectors demands a steady stream of SET graduates to fill SET-related posts.

Figure 2.3: Proportion of women graduating in mathematics, science and technology fields (2009)

(Source: Eurostat, Education Statistics, UOE data collection)

The conclusion can be drawn that much progress has been made in terms of the unequal access to SET. Access to scientific information at pre-school and school level has increased for the majority of countries, although this challenge remains for the majority of developing countries.

As regards to higher education there has been a rapid increase in the proportion of female student enrolments and graduations in all fields and in most countries even overtaking that of male students. This is also true at post-graduate level, although the biggest gap remains at doctoral level. That the number of female PhD graduates is increasing at a much faster rate than that of their male counterparts is encouraging. In SET specifically, female graduates are also managing to close the gender gap and in many instances make up the majority of SET graduates. It is also evident that countries that have put active measures in place to increase the access and participation of women in SET have been reaping the rewards. This leaves us with the question: If then in the majority of instances we have managed to increase and in certain cases equalize the access of women in SET, why are they struggling once they enter the field and in many cases 'leaking out' of the pipeline? In an effort to answer this, the discussion will now move to a discussion of the causes associated with the unequal participation of women in SET.

2.2.2 Male-dominated nature of science

The male-dominated nature of science will be discussed from a quantitative (composition of SET workforce) and qualitative (ease of participation) perspective. An overview is provided of the active participation of women in the SET workforce.³ The biggest part of the discussion focuses on the 'masculine' nature of science, requiring certain qualities of scientists to compete and progress in SET.

³ The body of literature pertaining to 'access to scientific institutions' i.e. employment after graduation and types of employment such as formal, fulltime, part time and 'tenures' could further enhance this section of the study – it has however been excluded as coverage of the quantitative aspects of participation is of more value within the context of the particular study.

The case is also made that men have for many years dominated and determined the agenda and measurement of success (with specific focus on knowledge production) in science. The concepts of 'male bonus', 'triple burden' and 'direct and indirect gender bias' are also highlighted to describe a working environment that most often leaves female scientists feeling unsupported and excluded from networking and recognition opportunities.

Quantitative participation

Germany, France and the UK collectively employ the largest number of researchers in the EU-27 and spend 60% of the total R&D expenditure in the EU (EC, 2009c). She Figures 2003 reported that in 2002, about half of the qualified human resources in SET in Europe were women. Furthermore, these women were also more likely than their male counterparts to be employed in a SET post, although the majority of them were overqualified for the position they were in. Women made up 44% of the total workforce in the EU-25 in 2004. For the same period, the SET workforce portion of women with tertiary education comprised 50% of the total, and 29% of all scientists and engineers were female. The growth rate (1998 - 2004) for women for the total workforce was 1.5% compared to only 0.4% for men and even higher at 4% for women and 2.2% for men in the SET grouping. Unfortunately, the growth rate for employed scientists and engineers only increased by 0.3% for women, compared to 2% for men between 1998 and 2004 (EC, 2009b). These patterns are repeated in She Figures 2006 with women comprising 48% of the SET workforce for EU-27 and of these, 48% were employed in positions that matched their qualifications, compared to 43% of men (Meri, 2008). She Figures 2009 indicates that the share of female researchers working in SET in Europe is growing at a steady pace (by 6.3% over the 2002-2006 period compared to only 3.7% for men). In terms of sectors, female researchers represent 39% of all researchers in the government sector, 37% in the higher education sector and 19% of researchers in the business sector. Latvia is the only EU-27 country where female researchers form the majority in all sectors (EC, 2009c).

As in Europe, almost half of the SET workforce in the US consists of women (NSF, 2011). The smallest proportion of female employees is found in the engineering field at 15%. Just more than 20% of the workforce in the physical and mathematical/computer sciences are women and the majority of female SET occupations are located within the medical and social sciences (especially teaching), ranging from just over 40% to as high as 90% (nursing).

As is evident from the above, much progress is being made to ensure the increased participation of women in SET. However, the European Commission (2009a:16) reports that the proportion of female researchers *'is growing faster than that of men but not enough to indicate that the gender imbalance in science is self-correcting'*. So, although more women are entering and actively taking part in SET, the manner (or ease) with which they participate is still challenged by the 'male-dominated' nature of science. This male-dominated nature includes a world of science that to a large extent requires women to portray certain masculine qualities in order to compete and progress alongside their male colleagues, who have for many years dictated the nature and agenda of science. It also allows the

subtle exclusion women experience from support, informal communication, collaboration and recognition (Fox Keller, 1991; Brouns & Addis, 2004; Etzkowitz et al, 2000).

Qualitative participation

To a remarkable degree, to learn to be a scientist is to learn the attributes of what our culture calls masculinity. It is to learn how to perform in a world definitively cleft in two (Fox Keller, 1992:47). Fox Keller proposes that in order to better clarify this relationship between men and women and the quest for science the focus should shift from 'women and science' to 'men, women and science'. Each of these terms is socially constructed and loaded and the author therefore further proposes a clear distinction between sex and gender on the one hand, and nature and science on the other.

If sex is a biological category into which we are born as male or female infants, gender is a cultural category that shapes our development into adult men and women. In this sense, gender represents a cultural transformation of sex. In much the same way, science represents a cultural transformation of nature. Nature in short does not appear to us unmediated. Representations of nature take their shape from the instruments, theories, and values that particular scientists bring to the task of 'revealing nature'. Just as the character (and values) of a culture are reflected in its socially agreed upon definitions of masculinity and femininity (its gender ideals) so too the particular instruments, theories, and values that scientists employ in their attempt to represent nature are reflected in the picture of nature that emerges from their desks and laboratories. In other words, while sex and nature might perhaps be said to be givens, gender and science cannot.'
(Fox Keller, 1991:228)

This explanation goes against the popular belief held by the early scientific feminists that if science is independent of its producers, there should be no place for gender in scientific discussion and it should be of no concern whether the producer is male or female; in other words that women with scientific minds should be able to participate in science equally to men (Fox Keller, 1991).

At the other extreme, the acceptance of gender-based difference has unfortunately also created another form of exclusion and compromise. If it is true that scientific performance is measured by a male-dominated way of 'doing science', anyone doing differently is seemingly failing. The effect of this being "not equal ability, but extra ability – the extra ability to compensate for the hidden cost incurred by the denial or suppression of a past history as 'other' " (Fox Keller, 1991:234). This links closely to the concept of 'male bonus' (Thorvaldsdóttir), which is described by Brouns and Addis (2004) as the acceptance that any person seriously pursuing a career in science, irrespective of gender, anticipates dedication to a particular field of study with a weighed expectation of success. This expectation implies long working hours and a competitive nature with limited time for anything that might distract from this. Regardless of the gender, scientists that portray this level of drive, competitiveness and dedication appear to be more successful. As these traits are traditionally associated with men, it is oftentimes the male scientists that benefit most from this culture in the field of science – implying that

they have an added advantage by the mere fact that they are 'male' and that it is somehow just accepted that they therefore possess these traits.

Besides the effect of the 'male bonus', the issue of the 'triple burden' also comes into play. Gupta et al (2004) found that even in countries that are economically, socially and politically diverse such as the US, Germany and India, the experience of the 'triple burden', for women in science is similar. The first burden is the usual stressors faced by any employee in an unfavourable work environment. The second burden refers to the usual tension of trying to achieve a work-life balance, even more so for women who are still traditionally seen as the primary caregivers of the family. Besides the physical exhaustion of managing both a career and home, this burden also leads to women having limited time for networking and travelling or having to take extended time off, for example for maternity leave. Subconsciously many women also start to limit their own career ambitions due either to their own or society's perspective that their family now needs to be their first priority. The third burden is however unique to the field of science and Gupta et al (2004:44) explains it as the burden of '*grappling with a deficit of social capital and a feeling of being aliens in science*'. This results from the isolation felt by women working in science; that their male peers subtly exclude them from support, informal communication, collaboration and recognition. The cumulative effect of trying to balance these burdens leads to fatigue and loss of ambition as many women are disillusioned by the world of science. The most common strategies for coping with the triple burden are found at the individual level where women themselves try to adapt to their surroundings, accepting the environment for what it is or in the worst-case scenario leaving the scientific sphere for other sectors that are seen to be more accommodating. Neither of these responses do anything to challenge the upholding of science as a male domain.

What the above section has described could also be referred to in terms of *direct and indirect gender bias*. Direct gender bias can be defined as the manner in which scientific ability is credited to a person based on gender, basically a double standard in the assessment of performance of men and women. This is strongly linked to the notion of male bonus and this bias comes into play when recognition, reward and promotion are determined by measures of scientific excellence linked to predominantly masculine traits such as drive, competitiveness and dedication. Indirect gender bias refers to the inadvertent harmful outcomes that the structuring and functioning of the scientific sphere potentially have in terms of limiting opportunities and creating challenges for female scientists (Brouns & Addis, 2004). So, besides being seen as 'female' and therefore not naturally possessing these masculine traits required to be successful in science, the indirect bias comes into play when female scientists are disqualified or discriminated against for not being able to always work the same number of hours without distraction due to their other domestic responsibilities. Another example of indirect gender bias (one again closely linked to the notion of triple bonus) is that of women not being included or given the opportunity to participate in the social networking necessary for recognition and advancement in science.

The common quantitative indicators that are used to measure the 'success' of a researchers' career are the number of publications in accredited journals, the degree of multiple authorship and the frequency of citation, which in turn also influence the degree of success in obtaining funding and the level of international conference attendance (Farquharson (2006), Fox (2005), Prpic (2002)). Brouns and Addis (2004) remind us that it is not only ability that determines whose papers will be published, but that social capital is just as important, as these publications also need to be read, debated and cited to be of any true value. Etzkowitz et al (2000) defines social capital as *'the productive resources a person gains access to through contacts that control critical resources, or creates with another person they have a relationship with'*. To accumulate this social capital implies participation in academic networks (formal and informal). Feller in Brouns and Addis (2004) implies that women are often disadvantaged when having their work published, read and cited, due to their lack of social capital. Scientists mostly pay heed to prominent established researchers and therefore would possibly read and cite the works of those they most frequently encounter during formal and informal networking. As stated previously, women are most often excluded from such networks.

It is not the purpose of this particular study to report on the knowledge production of male and female scientists and to comment accordingly. Much has been written and debated about this subject, particularly once the issue of gender is introduced to the discourse. The focus here is rather to provide some background as to how knowledge production is traditionally measured in science and how this contributes to the male-dominated nature of science and its resulting gender bias. When commenting on knowledge production, the literature most commonly refers to the indicator of publication output or bibliometrics. Typically, bibliometrics would indicate that women tend to publish fewer articles than their male colleagues do (Brouns & Addis, 2004). This phenomenon is known as the 'productivity puzzle'. The productivity puzzle, registered by Cole and Zuckerman in the 1980s, refers to the results of about 50 empirical studies, all indicating that female scientists publish just over half the amount of their male colleagues. This lower publication productivity for women is puzzling as the concept of universalism as describe by the *Mertonian norms of science* (published as *The normative structure of science*, 1942) holds that a scientist's unrelated characteristics, such as sex, race, nationality, class or religion do not influence his/her professional standing and success. Therefore, there has been a lot of interest in studying the productivity puzzle in the broader framework of the social organisation of scientific work. Prpic (2002) for instance found that for young Croatian female scientists', publication productivity is influenced more by their position in the social set-up of science than is the case for men (Prpic, 2002). The study found that the most important determining factor for female publication productivity was participation at international scientific conferences. She also summarises a number of other phenomena including the under-representation of women in science positions; the slower rate of achieving scientific academic degrees and ranks; fewer scientific accolades, awards and funding for female scientists; women holding fewer positions of influence; and less pay for female scientists. Brouns and Addis (2004) comment that the latest findings indicate that productivity has a stronger link with academic rank than with gender, thus explaining poorer publication output of women as the result of female scientists working at more junior positions than

men. They also go on to signal the importance of considering the variation across scientific fields when reviewing knowledge production.

Fox (2005:132) also points out that documenting *gender variation in productivity is one thing, and accounting for it another*. One such ambivalent factor is the relationship between marriage, children and publication productivity. On the one hand, the common belief is that good scientists are men with supportive wives, or single females with no children. The evidence however would seem to indicate just the opposite; that married women publish as much as or more than unmarried women (Fox, 2005). Furthermore, women in second or third marriages have higher productivity than women in first marriages do and this is directly related to the increased likelihood of marriage to another scientist, which seemingly has a positive effect on productivity. It would also seem that there are no conclusive findings regarding the presence or absence of children and the productivity levels of female scientists (Fox, 2005). Fox did, however, find that women with preschool children are more productive than women without children or with children of school-going age (2005). The study suggests that these women might be working in environments that are supportive in terms of childcare facilities and flexi-time and this is a matter for further investigation.

The statistics indicate that males are slowly losing their dominance in the SET workforce with the proportion of the female workforce growing at a steady pace and in some cases even exceeding the 50% mark. Unfortunately, many of these female scientists are working in positions for which they are overqualified and in an environment holding little promise for progress and promotion. This environment is one in which men still determine the scientific agenda and measurement of success requiring certain masculine qualities to be seen as a 'successful scientist'. In order to meet this measure, female scientists actually need to become more masculine in their approach to their work ethic or make the decision to move on to other environments that are more accommodating of their feminine nature and needs. For those that choose to stay the challenges remain of maintaining a healthy work-life balance, competing for the same recognition and reward as their male peers and ultimately progressing to a leadership position.

2.2.3 Tension of reconciling professional and private life

Various studies (Lane, Etzkowitz, Haataja et al, Cole and Zuckerman and Bradley) have been conducted investigating the link between women as scientists, and as spouses and parents, and what the effects of these roles are on their career development. The studies focused on married versus unmarried scientists; married women with or without children; type of households and family composition. These studies would suggest that the absence of more women in SET is due to role conflict. Role conflict is experienced when the demands of a particular role make it difficult for an individual to meet the requirements of another role. In this case the traditional role as caregiver makes it more likely that a female scientist will experience role conflict between her domestic responsibilities and the demands of her scientific career. Some contrary findings have however emerged. Nevertheless, the one finding that clearly stands out in all studies is that successfully managing this

reconciliation process requires additional resources and support. Lane (1999) believes that most women carry the primary responsibility of childcare and unless family-friendly policies are encouraged in the scientific environment, women will continue to be distracted from their day-to-day tasks and career development. Childcare also sometimes means that the female employee is physically removed from her workplace for long periods. This then leads to issues around retraining and the costs involved for the individual and an industry as a whole.

Cole and Zuckerman (1987) is one of the few studies that indicate that the possibility exists for combining a career in science and motherhood. The study asked 120 scientists (73 female and 47 male) the following questions: whether they believed that marriage and motherhood were in general incompatible with a scientific career; whether this had been their experience specifically; and what quantifiable effects marriage and motherhood had on the research output of women scientists. Both men and women felt that they had encountered the general belief that these two spheres of life were not compatible, especially so for the older scientists. The older respondents felt that it appeared impossible for a female scientist to have any career once she had made the decision to get married and/or have children. Women would thus have to choose between either a serious scientific career or marriage and children. It was surprising that even many young respondents felt that this belief was still very strong among their peers.

When reviewing the actual impact of marriage and children on the careers of distinguished women scientists, the following contrary findings were made:

- On average, married women scientists published slightly more over their careers than single women.
- During the three years before and after the births of first children, the annual published productivity of women rises from 1.5 to 2.7 annually.
- The rate of publication of these women scientists is unrelated to the number of children they have.
- There is a marked upward trend in the number of papers they published after the first decade of their careers, following lower publication rates when they were young and had young children.

When these women were asked how they managed to continue with successful scientific careers despite having families, they reported a variety of reasons. These included that thinking about science continued at home and during domestic chores and that ideas and work were discussed with their partners (if they were married to other scientists). They also noted that professional responsibilities, other than research, were more limited for younger female scientists and that lower publication rates during the early stages of a scientific career could be a characteristic of the starting phase as opposed to the burden of domestic demands. This last point was also emphasized by the fact that, on average, even single women and married men displayed low publication levels in the first ten years of their careers. It was also found that other factors seem to influence the ease with which female

scientists combine family and career roles, such as choosing to have their children during later parts of their careers, marrying other scientists and ensuring child care and household support.

Etzkowitz et al (2000) make mention of a number of studies that illustrate the impact of family life on the choices women scientists make in relation to their careers. A study among younger Finnish women scientists discovered that they see themselves as primarily responsible for the reproductive activities of the family. To incorporate this role with that of a professional career they adopted a strategy of planning their first children while writing their master's thesis, and then had their second child before beginning their academic careers. Another aspect is illustrated by a study of female professoriate in Dutch universities that found that many of these women are childless. The majority were of the opinion that a successful research career and a family is '*a difficult to impossible combination*'. A study in the early 1980s of Israeli women found that almost two thirds of full professors were also parents. The unexpected high productivity demonstrated that the dual role of career and parenting does not necessarily have to be a negative one. These women did however report that raising children impacted negatively on their ability to attend international meetings and on fellowship and international research opportunities. Danish women scientists reported that one of the major effects of motherhood was the loss of research opportunities, because they often can only work normal working hours. Finland has shown substantial growth in the status of women in science. It is however noticeable that the women are older than the men are at all levels of the scientific career path. The majority of these women are married and more than half have children by the time they receive their PhDs. Although they find their dual roles challenging, most feel that their family life makes up for the disadvantages and emotional stress experienced in their work environment (Etzkowitz & Kemelkor, 2001).

Italy also experienced a noticeable increase in the participation of women in higher education during the post-war era. Although women entered the lower career levels of the tertiary system in much the same percentage as men, their participation declined swiftly at the upper levels. Once again, as in other countries, one of the main reasons given by female scientists for this lack of participation at the higher levels was the strain of trying to pursue a professional career while fulfilling their family responsibilities. The traditional family environment would free men to pursue their research and networking opportunities, while the same could not be said for women. Most women scientists in Turkey grow up in upper-class well-educated families. They receive two cultural messages while growing up: the traditional expectation of marrying and having children and the other of becoming highly educated and successful in their own right. This is supported by the fact that many of these women marry other researchers and that support structures such as childcare are available (Etzkowitz & Kemelgor, 2001).

The extreme is found in a report from the Commission of the European Communities (2005) submitted to the European Council that comments on gender equality in science. It reports that traditionally female scientists have a lengthy period to qualification and experience high levels of

career instability and mobility during their careers. This would seem to be encouraged by the trend that more professional women, both in academia and industry, are opting for single lifestyles without children. The commission recommends that in an effort to counter this, a more family-friendly working environment needs to be implemented to indicate to female and male scientists that it is welcomed and doable to combine a family and a career. Noordenbos (2002) supports this by stressing the importance of creating an environment that makes advancement possible, while at the same time recognising that women need support structures such as maternity leave and part-time jobs.

Haataja et al (2006) highlights the persistence of the gender gap in the general labour market and the tension of work-life balance as one of the main contributing factors. The data does seem to indicate a link between participation in the labour market and the number of hours worked and parenting responsibilities across gender. It is interesting, however, that the impact is mostly negative for women while it is positive for men. For the majority of European countries women (aged 20-49) with children have lower employment rates than those without. In the case of the EU-25, the employment rate falls from 75.4% for women without children to 61.1% for women with children. Part-time employment is also higher (23.3%) for women with children than for women without (15.9%). On the contrary, employment rates of men with children are higher (91.2%) than among men without children (85.6%) and the share of part-time workers becomes even lower. Also the majority of women in the US qualified to work in SET cited family responsibilities as their main reason for being unemployed or only working part-time, whereas the majority of men reported retirement as the number one reason for unemployment and part-time employment (NSF, 2011).

Bradley (2007) conducted a study among young adults in Bristol and found that the most popular choice when trying to achieve some sort of life-work balance was that of a part-time and flexi-work option. These young women are choosing not to give up their careers but rather to delay it for a set period – they want to have a career in the future, but for the immediate period maternity and parenting takes preference. They still want to 'have it all', but sequentially rather than concurrently. Unfortunately not many establishments cater for this form of employment, and if so, usually not substantially enough to make it financially viable. Very few initiatives currently exist to address this particular group of 'returners' to the field of SET. Although this study is not specific to women working in science it does relate to working women in general and therefore most probably could apply to this particular grouping as well.

The literature is evidently inconclusive about the link between women as spouses/partners and parents/care-givers and women as professional scientists building a career. Some studies support the popular belief that being a successful female scientist does not 'fit well' with distractions such as committed relationships and parenting and often results in women choosing to postpone or deny such commitments. Others again seem to suggest that in certain instances having a life outside of science can actually enrich and motivate a scientific career path, especially when appropriate support and understanding is present.

The reality is that women should have the freedom to make these decisions without the pressures of having to choose sides (as this is commonly not the case for men). Therefore, the SET environment needs to be realistic about the need to put the necessary support structures in place to accommodate the realities of women with private lives and responsibilities. Otherwise, the sector will keep on paying the expensive price of losing highly skilled persons for periods as they fulfil family obligations and then having to retrain them at high cost, or worst case just losing them to science completely.

2.2.4 Differences in reward and recognition

The literature is very clear about the difference in career opportunities for men and women working in SET. This is especially true in relation to the ability to access funding for further research (research funding success rate), the right to earn equal pay for equal work (salaries), possibilities for promotion, and recognition through prestigious fellowships and grants. These differences will be discussed as they relate to reward and recognition for men and women working in SET. Reward is explored as it relates to: (1) Funding (the application for research funding and research funding success rate), (2) salaries, and (3) promotion. Recognition is explored as it relates to the acquisition of professional and social status through the awarding of fellowships and awards.

The Global Gender Gap Report (2003) measures 'economic participation' in terms of 'the participation gap, the remuneration gap and the advancement gap'. The literature would indicate that most countries are succeeding in closing the participation gap or moving towards horizontal gender equality, but that vertical segregation (the remuneration gap and advancement gap) remains a challenge. Vertical segregation highlights the variation in the gender representation for a complete hierarchical system, and subsequently also indicates the differences in career opportunities (EC, 2003a). *Vertical segregation describes the difference in status (and consequently reward) in the paid work undertaken by women and men, where men are over-represented in positions of seniority within organizations and women are over-represented in junior and less skilled positions* (Irving, 2008:166).

One such example is found in the policy implementation during the communist regime in Central and Eastern Europe that resulted in equal access to education and full-time employment for both genders; access to childcare facilities, legal protection for women and state support for working mothers. On a positive note, this has resulted in a situation where this region currently has a pool of highly qualified and skilled women working in all public sectors and especially in science. Unfortunately, this form of forced gender equality was achieved and maintained primarily through political censorship and led to an increase in horizontal and vertical segregation across all sectors. A further result of the political transition in these countries is the restructuring of research systems that are now characterized by limited funding and promotion opportunities for young female scientists. So even though the number of male and female researchers is balanced, closer analysis reveals that women are not found in the competitive thriving R&D systems, but are mostly placed in struggling systems as a kind of 'back-up

human resource' (EC, 2003a). To attract young women to a career in science means having to address these vertical discrepancies.

Funding as reward

Applications for research funding

One of the main rewards for any scientist is access to funding for further research. As Bailey et al (2004) rightly point out, research funding is a critical policy instrument used by government to try to stimulate increased research in critical areas and in aligning research capacity to the national goals and socio-economic development and international competitiveness. Funding then also inherently builds research capacity on an institutional and individual level as it potentially allows for skills transfer and the completion of postgraduate study. The logic in all of this would then be that if the presence of more women in SET were a priority for government, that more women should be the recipients of public research funding. Successfully applying for external research funding is also seen as essential for career advancement, as this is often used as an indication of excellence in a promising research career (Husu & Koskinen, 2010).

In 1997, the Swedish Medical Research Council (MRC) conducted a study on research funding that found that gender bias was indeed real in the manner in which research rewards were being made (Wenneräs & Wold, 1997). The primary aim of the study was to determine whether the peer-review system of the MRC evaluates male and female applicants on an equal basis. The idea of the study was kindled by the fact that the success rate of female scientists applying for post-doctoral fellowships at the MRC during the 1990s was less than half that of male applicants. Wenneräs and Wold reported that: *Our study strongly suggests that peer reviewers cannot judge scientific merit independent of gender. The peer reviewers over-estimated male achievements and/or under-estimated female performance, as shown by multiple-regression analyses of the relation between defined parameters of scientific productivity and competence scores* (1997:341).

All applicants applying for MRC fellowships were required to submit a curriculum vita, a bibliography and a research proposal. Each application was reviewed by one of 11 evaluation committees each responsible for a specific research field. Five reviewers of the specific field committee then rated the individual applicant. Each reviewer scored the applicant based on three parameters namely scientific competence, relevance of the research proposal and the quality of the proposed methodology. The scores of each reviewer were then multiplied with one another to produce a final score of between 0 and 64. The process was finalised with the average of the five product scores of the applicant being computerised, resulting in a final score that formed the basis on which the applicants to each committee were ranked. Using the 1995 MRC post-doctoral applications (with 62 men and 52 women) the study found that the MRC reviewers assigned lower average scores to female applicants compared to male applicants on all three evaluation parameters. Women scored 0.25 fewer points for scientific competence, 0.17 fewer points for quality of the proposed methodology and 0.13 fewer points for relevance of the research proposal resulting in a substantially lower final score for female

applicants (13.8 versus 17.0 points on average). The process resulted in four women and 16 men being awarded post-doctoral fellowships. As the parameter of scientific competence indicated the weakest attribute for female applicants, this is generally regarded as the parameter related to the number and quality of scientific publications, the researchers work from the assumption that women earned lower scores because they were less productive. They investigated this hypothesis by measuring the scientific productivity of all 114 applicants and then compared the peer-reviewed ratings of groups of male and female applicants with similar scientific productivity. The scientific productivity of each applicant was measured in six different ways:

- The applicant's total number of original scientific publications;
- The number of publications with the applicant as first-author;
- Addition of impact factors of each journal of publication to generate total impact measure of applicant's total number of publications;
- First-author impact measure by adding together impact factors of the journals in which first-author papers were published;
- Total number of times applicant's scientific papers were cited during 1994 using science citation database; and
- Repeated measure five for papers on which the applicant was first author to produce 'first-author citations'.

The study found that peer-reviewers assigned lower scores to female applicants although they displayed the same level of scientific productivity. Even the most productive group of female applicants, the only group of women judged to be as competent as their male counterparts, was only as competent as the least productive group of male applicants.

To determine the cause of women's lower scores and to reveal the factors that exert a primary influence on a particular outcome a multiple-regression analysis was done. The multiple-regression model indicated that female applicants started from a basic competence level of 2.09 and were assigned an additional 0.0033 competence points by the reviewers for every impact point they had accumulated. Independent of scientific productivity however male applicants were awarded an extra 0.21 points for competence – in other words a female scientist needed to exceed a male colleague's productivity by 64 impact points to be awarded the same score of competency. Taking into consideration the mean total impact of this cohort of applicants was 40 points, the study found that women needed to be 2.5 times more productive than their male colleagues were in order to access the same financial support.

Research funding success rate

The EC (2003a) defines the *research funding success rate* as the percentage of women applicants who are successful in receiving funding because of their applications. In 2001, women in the EU-25 were in general somewhat less successful than their male counterparts were in accessing funding. The UK was the country with the smallest portion of research funding for women (13.7%) in general

and the country with the biggest gender gap, with 27.9% of males successfully applying for research funding. In Hungary (50% for women versus 61.8% for men) and Lithuania (33.3% for women and 48.1% for men), women were also much less successful in accessing research funding than men. A few countries where women were more successful in applying for research funding than men are Denmark (32.9% for women versus 29.5% for men), Ireland (35.3% versus 28.5%), Netherlands (38.7% versus 34.8%), Finland (25% versus 22.1%), Cyprus (25% versus 22%) and Iceland (59.8% versus 56.6%). The author also stresses the importance of taking various cultures of rewarding into consideration, such as Slovakia where almost all applicants irrespective of gender receive funding versus countries such as Finland and UK where funding is much more competitive.

She Figures 2009 (reporting for the EU-27 for 2007) reported similar figures with 21 countries indicating slightly higher success rates for men (no more than 10% for any country) in research funding applications and only seven with higher success rates for women. The gender gap did however narrow slightly over this period, from 7.2% in 2002 to 6.4% in 2007. A more detailed report by the EC (2009c), looking specifically at the issue of gender in research funding, reported no vast gender imbalance in the success rates in research funding for the EU-27. The report points out that this picture of relative equality in distributing research funding is the result of such actions as national policies on gender balance targets (e.g. Slovenia, Switzerland), legislation on gender quota (e.g. Finland, Norway, Iceland), and policies on university funding based on gender equity performance (e.g. Germany, Netherlands, Ireland). What the report however did point to is that women are less likely to apply for funding than men, are less likely to re-apply, apply for smaller amounts, and apply for less prominent funds and for shorter periods. The United States' National Science Foundation and the Australian Research Council also reported similar trends when reviewing research-funding data in their own countries.

More recently Husu and Koskinen (2010) reviewed the success rates of women and men in applying for research funding in 13 EU countries (Austria, Germany, Greece, Finland, France, Lithuania, Russia, Serbia, Slovakia, Spain, Sweden, UK and Chile) as part of a bigger study reviewing scientific excellence in the technology and engineering field. The Academy of Finland reported no gender difference in the success rate of applicants for research funding (21% for both men and women). The same trend is observed for the UK's Engineering and Physical Sciences Research Council (EPSRC). The Swedish Research Council reported almost equal success rates, with 25% for female and 26% for male applicants. These findings could possibly indicate that the gender gap in applying for research funding in technology and engineering is on the decline in some parts of Europe. There are however still instances, such as Chile, where women had a lower success rate than men (29% versus 43%) in applying for funding from the Science and Technology Development Fund (FONDECYT).

Table 2.5: Number of applicants and beneficiaries of research funding by sex and female proportion (2001, 2007)

	2001						2007					
	Applicants			Beneficiaries			Applicants			Beneficiaries		
	F	M	F%	F	M	F%	F	M	F%	F	M	F%
Austria	207	891	18.9	85	464	15.5	796	3830	17.2	399	2279	14.9
Belgium	870	2846	23.4	457	1573	22.5	551	799	40.8	364	428	46.0
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-
Croatia			-	-	-	-	216	310	41.1	264	269	49.5
Cyprus	20	91	18.0	5	20	20.0	10	40	20.0	10	21	32.3
Czech Republic	53	230	18.7	17	86	16.5	744	3480	17.6	571	2747	17.2
Denmark	584	1709	25.5	192	505	27.5	964	2378	28.8	247	747	24.8
Estonia	232	670	25.7	194	588	24.8	256	535	32.4	189	442	30.0
Finland	500	1224	29.0	125	270	31.6	1138	1942	36.9	285	442	39.2
France	-	-	-	1547	2353	39.7	-	-	-	-	-	-
Germany	2522	19144	11.6	1465	12043	10.8	3339	13088	20.3	2042	8045	20.2
Greece	888	745	54.4	222	229	49.2	888	745	54.4	222	229	49.2
Hungary	266	903	22.8	133	558	19.2	291	920	24.0	99	389	20.3
Iceland	338	606	35.8	202	3343	5.7	305	606	33.5	176	330	34.8
Ireland	153	260	37.0	54	74	42.2	1451	1778	44.9	214	292	42.3
Israel	236	1119	17.4	71	435	14.0	182	385	32.1	40	86	31.7
Italy	-	-	-	-	-	-	796	3003	21.0	154	733	17.4
Latvia	285	573	33.2	231	471	32.9	244	510	32.4	239	460	34.2
Lithuania	24	77	23.8	8	37	17.8	172	292	37.1	51	96	34.7
Malta	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	648	3213	16.8	251	1117	18.3	1062	3136	25.3	339	1146	22.8
Norway	1041	4086	20.3	382	1638	18.9	1432	3772	27.5	528	1499	26.0
Poland	2513	6401	28.2	1008	2733	26.9	2920	6081	32.4	990	2297	30.1
Portugal	1152	1013	53.2	465	465	50.0	1365	1228	52.6	621	560	52.6
Romania	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	45	124	26.6	43	122	26.1	148	582	20.3	22	113	16.3
Slovenia	219	215	50.5	446	527	45.8	387	893	30.2	185	422	30.5
Spain	-	-	-	712	669	51.6	3932	4079	49.1	1202	1432	45.6
Sweden	1206	4039	23.0	472	1827	20.5	1206	4039	23.0	472	1827	20.5
Switzerland	-	-	-	-	-	-	829	2341	26.2	475	1507	24.0
United Kingdom	8561	20068	29.9	1169	5609	17.2	2970	9848	23.2	822	2768	22.9

(Source: She Figures 2003, She Figures 2009)

Salaries as form of reward

Besides research funding, salaries are another form of recognition and reward. If we consider that worldwide women are generally employed in lower ranking positions than their male counterparts it is logical that the majority of women are then also paid less than most men. This is confirmed by an European Union report (Löfström, 2009) indicating that in 2007 all EU countries on average paid women 17% less than men, with the gap ranging from as little as 4.4% in Italy to as much as 30.4% in Estonia. The report also goes on to point to an interesting trend in the remuneration of women. Firstly, that women are mostly working in lower paying fields such as services, social and health care and secondly that when women start to infiltrate what is seen to be a male occupation the remuneration growth in that occupation seems to slow down, which might support the idea that pay gaps are at

least partially due to gender discrimination. Even Finland, once again used as the prime example of gender equality, has not been able to reach the goal of equal pay for equal work. Haataja et al (2006) report that for the general working population in Finland the variation in pay between women and men is about 18% in favour of male employees.

Although there is limited data available in the SET sector about gender pay gaps, the EC (2010b) reports that even limited data do seem to show that women in research are paid less than their male colleagues are. In 1999 the UK's Bett Review of academic salaries reported that women were being paid less than males at every grade of the university hierarchy and almost ten years later a survey of over 7 000 scientists working in SET still found a discriminatory 23% pay gap between the genders (EC, 2010b). The EC in 2007 produced a report, '*Study on the remuneration of researchers in the public and private commercial sector*', which reported a significant difference in remuneration between male and female researchers in most of the EU-25 countries. This difference ranged from just below 15% in some countries (Bulgaria, Denmark, Greece, Iceland, Malta and Norway) to over 35% in others (Estonia, Czech Republic, Israel and Portugal). The Figures 2009 reported the gender pay disparity (2006) for physical, mathematical and engineering sciences (EU-27) as 29% and for the entire economy at 25%. The report also highlights that not a single country had equal pay for men and women, although almost all have legislation enforcing equal remuneration. In the US, women working in SET in general earn less than their male colleagues, however male and female doctoral researchers with similar qualifications and experience working in higher education tend to earn similar salaries (NSF, 2011).

The following sums up the gender pay gap challenge rather accurately:

The gender pay gap is the widest in those occupations that are most open to high-level female researchers. However, the gender pay gap is large everywhere, even more so in public enterprise. It also widens as the age of researchers increases. This illustrates the workings of a Glass Ceiling that women hit during their ascent in the academic hierarchy. It is important to highlight that there is no spontaneous reduction of the gender pay gap over time. (EC, 2009a:72)

Promotions as form of reward

Although not widely documented, promotions are also another form of reward. Palomba (2004) conducted a study of 1 022 scientists (244 women and 798 men), who entered the CNR-National Research Council (the largest Italian public research body) at B-grade in the same year, in an effort to measure the presence of vertical gender segregation. Palomba hypothesised that there is a relationship between promotion and permanency in that women and men with the same lengths of service in a certain career grade and the same competence should have the same likelihood of being promoted to more senior levels. Thus, the increase in the female representation at entry level should result in an increase in female representation in the top scientific levels. However, the data indicates that after 11 years of permanence on the B-grade, women only have a 13.5% likelihood of being promoted to A-grade, while their male counterparts have a 28% chance. After seven years of

permanence in B-grade the men have a 23% probability of being promoted to A-grade and women only an 11.9% probability. The analysis was also applied to university professors (at Italian universities) and the results indicated the same trend, with men being twice as likely to become an associate professor and 30% more likely to become a full professor.

Recognition - Professional and social status

While reward is more tangible in nature, recognition through the acquisition of professional and social status is often just as important in motivating scientists to move forward in their scientist careers. This type of professional recognition is often attained by receiving prestigious awards and fellowships in honour of one's talent and contribution within the scientific community. This type of recognition not only serves to motivate female scientists and establish them among their peers but it also highlights them as role models and mentors for younger women coming into the system. If women scientists are not visible and not seen to be succeeding in their careers, they cannot serve as role models to attract and retain young women in scientific professions. The most noteworthy of these awards must be the Nobel Prize. Between 1901 and 2011, 871 Nobel Prizes have been awarded to various individuals. Of these 773 were awarded to men and only 40 to women, and of these 40 only half were in the fields of physics, chemistry and medicine (www.NobelPrize.org).

The EC (2009c) reports on what they group newly established 'prestigious grants, positions and prizes', one of these being the KNAW fellowships. The Royal Netherlands Academy of Arts and Sciences (KNAW) annually appoint five prominent senior researchers as Academy Professors, which has a value of one million Euros per position. The placements are aimed at releasing senior scientists of their administrative and management tasks for five years so that they can focus on research and training younger scientists to eventually fill their positions. The boards of Dutch universities are invited to submit two nominations each per year and of the 25 researchers that have been appointed to date, only two were women. Brouns (2004) investigated the selection procedures of KNAW fellowships and used a research sample composed of researchers from the University of Groningen. From this institute only 11% of the candidates proposed for a post-doctoral fellowship were women, which is surprising as one out of every four doctoral students is female. Even faculties with a large number of female doctorates (mathematics with 131 women) selected none or very few female post-doctoral candidates. Only the faculties of arts and medicine presented a gender ratio nomination comparable to that of the gender ratio of their doctoral candidates. The research also found that these two faculties were the most transparent in terms of procedures such as selection criteria, public announcement for applications, and reporting on the selection process and results. The other faculties had very little to no documentation on the selection criteria or process and it would seem that the selection was based mostly on informal networking. This leads Brouns (2004) to conclude that science is still very much a male-dominated field and that transparency of procedure is crucial when trying to provide women with an equal chance of receiving the necessary recognition and reward they deserve.

A meta-analysis by Bornmann, Mutz and Daniel (2007) showed that internationally men have a 7% greater chance of successfully applying for grants than women and that the majority of the 66 panels they reviewed were fellowship schemes (EC, 2009c). Etzkowitz et al (2000) also points out that even when female scientists are awarded fellowships it often comes at a later stage of their career and therefore does not have the same impact as it might have if received earlier on.

The EC (2009c) also comments on various other European awards. The Linnaeus grants (Sweden) are worth up to about one million Euros annually over ten years and, from the first round of applicants in 2006, men have had a 21% success rate compared to 15% for female applicants. By 2008, the success rate of these applicants had just about equalised. When the French annually started awarding 'Chairs of Excellence' in 2005 there were no women awardees and by 2008, only two out of the 15 awardees were women. Finland also honours their top researchers with Academy Professorships - currently only 15% of all Academy Professors in Finland are women and only 3% of all women applicants have been successful compared to a 13% success rate for men. In France, an equivalent scheme exists, the Institut Universitaire de France (IUF), giving awards at both junior and senior level. In 2008, only seven women compared to 44 men were appointed in the senior category and 17 women compared to 59 men in the junior category. A promising feature for junior applicants is that they are eligible up to the age of 40 and an extra year per child is granted for maternity or parental leave. In the Czech Republic, the Academy of Sciences annually awards various academic prizes to exceptional researchers with substantial prestigious and financial reward attached to them. Across the board, between 2003 and 2007, these awards were predominantly (87%) awarded to male researchers. The Dutch National Research Council (NOW) annually awards only four Spinoza prizes to internationally esteemed Dutch researchers. The prizewinners each receive 1.5 million Euros to spend on research of their choice for a five-year period. Between 1995 and 2007, 48 Spinozas researchers have been awarded and of these, only seven have been to women. The German Research Foundation (DFG)'s most prestigious award is the Leibniz prize, which has been awarded since 1985 and has a value of approximately 2.5 million Euros. For the 2002-2008 period 77 Leibniz prizes have been awarded, only ten of these to women. The two most prominent scientific awards are the Marcel Benoist Prize, for established scientists, and the National Latsis Prize, for promising younger scientists – each to the value of 100 000 Swiss Francs. Over the past 30 years, the Marcel Benoist Prize has never been awarded to a female scientist and of the 22 researchers that have been honoured with the Latsis Prize, only six have been women.

It is clear that women working in SET are not rewarded and recognised to the same extent as their male counterparts. During the 1990s and early 2000s, women had a much lower research funding success rate than men, but recent figures seem to indicate that, at least for the EU-27, there is relative equality in the awarding of research funding due to various gender policies being put in place over the past 15 years. However, equally disturbing are reports of gender bias in the manner in which rewards are often made, requiring women to 'outperform' their male colleagues in order to receive the same funding awards. Other disturbing trends are that women are less likely than men are to apply for

funding; are less likely to re-apply for funding; and apply to less prominent funds for a shorter period. Remuneration is another clear indicator of the inequality in SET. There is not a single country that pays male and female scientists equally for the same type of work. This is despite many having legislation in place enforcing equal remuneration. With these trends, it is hardly surprising to find only a small minority of women who persevere and eventually take up leadership positions in science.

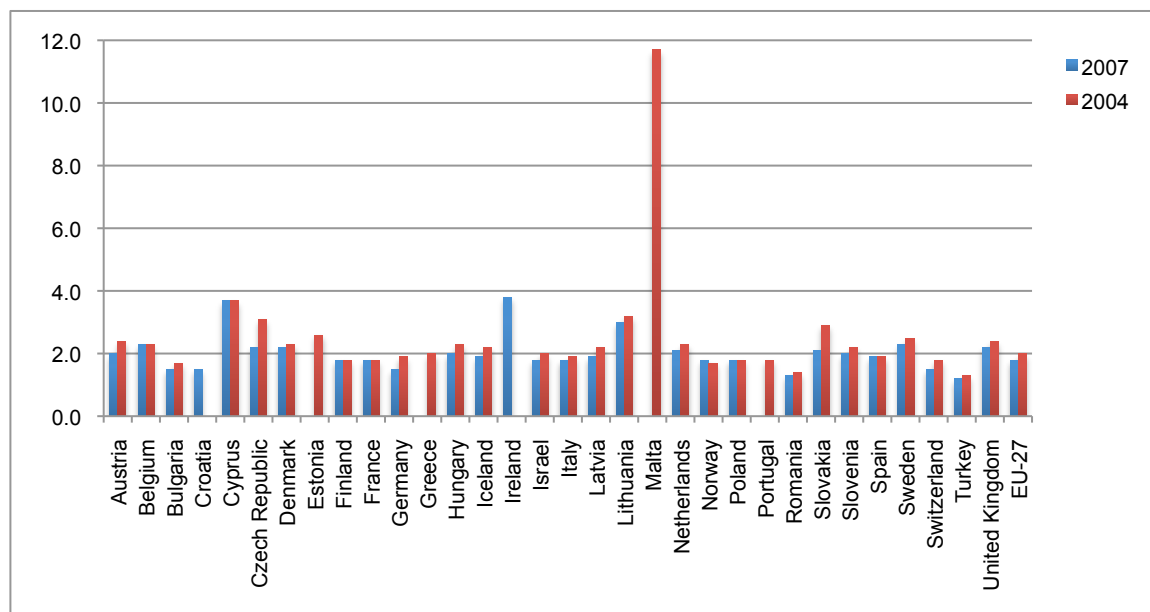
2.2.5 Lack of female representation in leadership

The lack of female representation in key leadership positions in SET is of concern as this limits their role as gatekeepers and their potential impact at policy and decision-making level. The absence of women in SET leadership is evident from statistics on the Glass Ceiling Index (GCI), the membership profile of academies of sciences, the gender composition of scientific boards and the composition of publication boards of academic journals.

Glass Ceiling Index

Gupta et al (2004) emphasises the need for female representation in key management and committee positions and at a critical mass. Such positions will allow female scientists the opportunity to establish the necessary networking and advocacy platforms needed to drive gender issues, while at the same time giving them the opportunity to display their diverse skills at a level of impact. Harding (1992:63) even goes so far as to state that: *The issue is not that there are few women in science, for there are vast numbers of women with science degrees working in the scientific enterprise. The issue, instead, is why there are so few women directing the agendas of science.* Although the majority of university graduates in Europe are female, the percentage of female representation in senior science positions and representation on scientific boards, although increasing, is still very low. This would mean that their individual and collective opinions are not necessarily having an impact at policy and decision-making level and that their voice is not being heard as regards the setting of the research agenda and allocation of resources and funds. (Commission of the European Communities, 2005).

GCI is one measure used to indicate the struggle women face in accessing the highest levels of employment. The index measures the relative chance of women, as compared with men, of reaching a top position. The GCI compares the proportion of women in grade-A positions (equivalent to Full Professor in most countries) to the proportion of women in academia (grade A, B and C) indicating the opportunity for women to move up the ladder. The GCI can range from 0 to infinity. A GCI of 1 indicates that there is no difference between women and men being promoted, while a score of less than 1 indicates an over-representation of women at a particular grade and a score of more than 1 towards a Glass Ceiling Effect. This supposes that the higher the value, the thicker the Glass Ceiling and the more challenging it is for women to move into top ranking positions. In 2006, on average for all EU-27 countries, the GCI equalled 1.8, the lowest being 1.3 in Romania and the highest 11.7 in Malta.

Figure 2.4: Glass Ceiling Index (2004, 2007)

(Source: She Figures, 2009)

Membership profile of academies of sciences

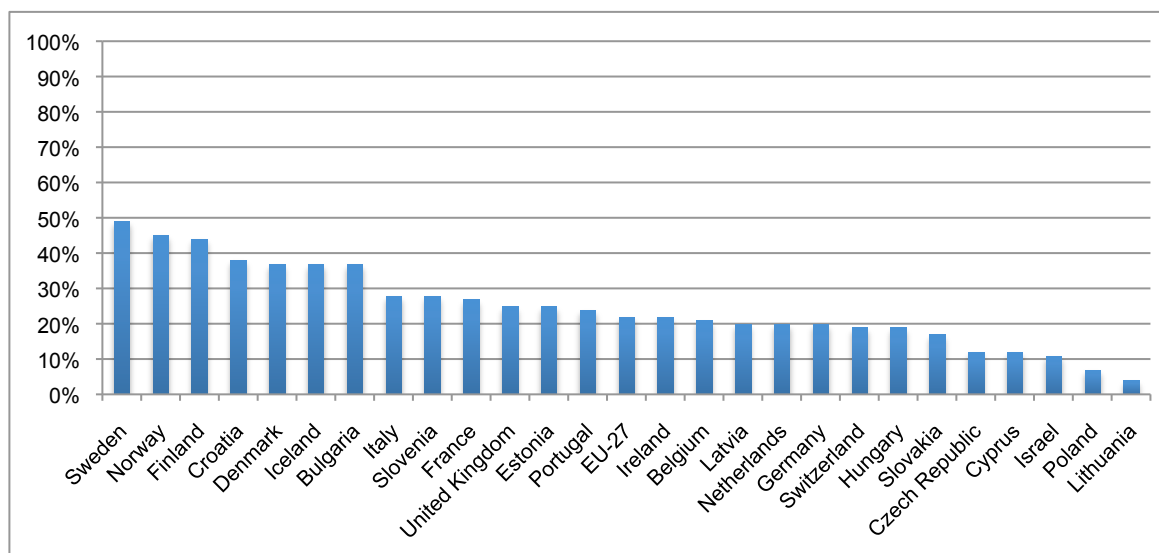
One example of where it would seem that the higher the academic position, the fewer the number of women at the 'top' is the membership profile of academies of sciences, to which only prominent scientists are elected. Although we now see a steady increase in the number of female members, history shows that this increase in the election of female members only started after 1970. In 1902, the first female scientist was proposed as a candidate for the fellowship of the Royal Society, but as a married woman she had no legal status and it took a further 42 years before a female scientist was again proposed and accepted. By 1992, 47 women had been elected to fellowship of the Royal Society, only representing 3% of all fellows. Surprisingly the French Academie de Sciences only elected its first female candidate in 1962 (Mason, 1992). Estonia's portion of female researchers stands at 43%, yet the Estonian Academy of Sciences has since 2000 only had one female full member (compared to 57 male members) (EC, 2009c). In 2008, the Hungarian Academy of Science (HAS) had 263 full members of which only ten were women.

Theories on exclusion and discrimination and networking illustrate how the male dominated academies create barriers for women and how these male scientists have more professional contact with other men, while the same cannot be said for women. Noordenbos (2002) believes that female representation will only increase once members of these academies realise that they are not as gender neutral as they think and opportunities are created in all fields and all levels of academic institutions that could afford these women an equal chance to become members of academies of sciences. Noordenbos also found, in studying the history of the first female members of academies of sciences, those progressive male members who convinced other male members of the outstanding scientific skills of these women obtained entry for women. Once they were then full members, they were able to ensure membership for other women.

Gender composition of scientific boards

Another indicator of the measure of female representation in scientific decision-making at senior level is the gender *composition of scientific boards* (including scientific commissions, boards, councils, committees, foundations and field-specific boards). The Figures 2009 reported that on average in the EU-27 22% of board members are women and the most prominent scientific institutions are still mostly managed by men. Bulgaria, Finland, Denmark, Norway, Sweden and the UK are the only EU-27 countries that have more than 30% female representation on their scientific boards (EC, 2009c). Sweden, Norway and Finland's share of female representation at board level exceeds 44%. With the exception of Bulgaria, all the other countries are actively involved in pursuing gender equality within national institutions and gender mainstreaming is a common policy strategy.

Figure 2.5: Proportion of women on scientific boards (2007)



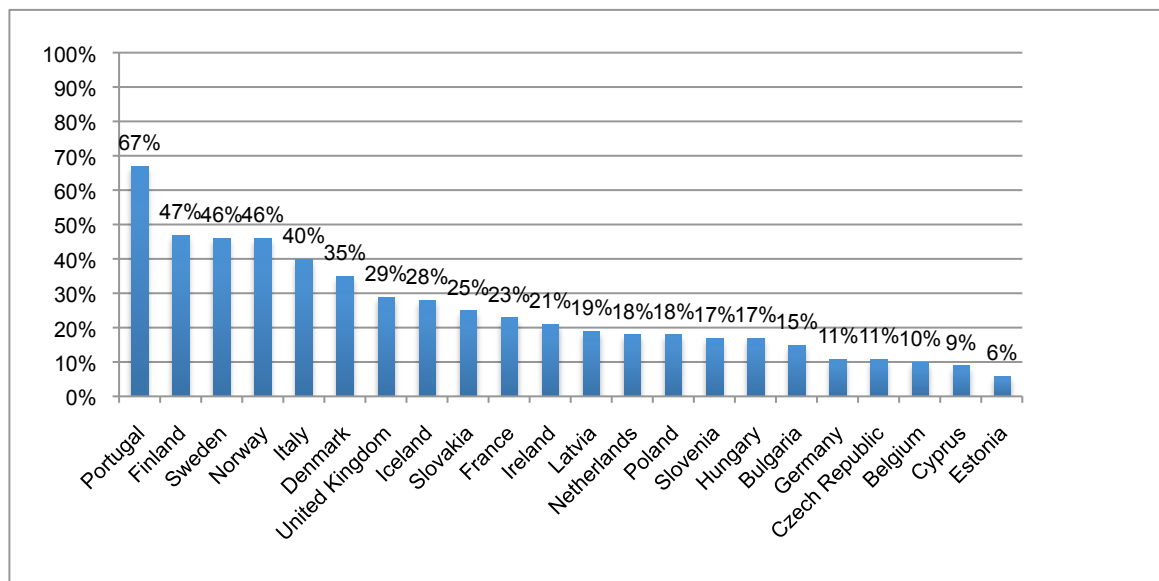
(Source: She Figures 2009)

Compared to 2001 figures, countries such as Iceland, Bulgaria, Slovenia, Estonia and Belgium have managed to substantially increase the proportion of female representation on scientific boards. Unfortunately, other countries have shown a remarkable decline in the proportion of female representation, most noticeably Portugal, Italy, Slovakia and Poland.

The Academy of Finland Board and Research Council is one of the few countries in the world that has equal gender representation for each board, however women still only comprise 28% of evaluators and reviewers and only 6% of all evaluators for Natural Sciences and Technology are women. In 2004, Poland only had 7% female representation on scientific boards despite the fact that 41% of all researchers in HE are female and have one of the highest proportions of female full professors in the EU. Portugal boasts having strong female representation in research with women dominating in all fields except engineering and technology, and yet in 2005 out of the seven science councils, only 17% had female representation and only one of the councils was chaired by a women. In the Slovak

Republic, only 10% of scientific board members are female although women make up 41% of all researchers (2007). Sandström and Hällsten (2004) examined the success rate of both genders in applying for positions at Swedish research councils for the 1989 to 2000 period. On average, the success rate of male applicants was 5% to 10% higher than the success rates for females. As previously stated, in Latvia women are in the majority among researchers, but interestingly in 2007 the Latvian Council of Science (with representatives from the Ministry, Latvian Academy of Science, and the Conference of Rectors) consisted of 12 members of which only two were women. No female researcher has even held the Chair or Vice Chair for the Latvian Council of Science (EC, 2009c).

Figure 2.6: Proportion of women on scientific boards (2001)



(Source: She Figures 2003)

Gender composition of publication boards of academic journals

Addis (2004) highlights another forum where women are excluded from decision making, namely the publication boards of academic journals. Addis proposes that there are top, middle and lower boards according to their sphere of influence and that women have hardly any representation in the top boards, slight representation in the middle boards and are present mostly in the lower boards. The study found that only five of the 36 reviewed journals had a 20% representation of female board members. In six of the remaining journals, women had at least some representation on lower boards in an academic capacity. For the rest of the journals, 14 had female representation only in the form of editorial secretaries and the other 11 journals had no female representation. In contrast, it is rather common for males to be a managing board member of two or more journals at the same time. More field-specific, Husu and Koskinen (2010) found that predominantly male editorial staff produce the majority of international engineering journals. No top engineering journal has a female editor-in-chief and women only represent 8.7% of editorial staff. The distribution looks somewhat better for the top computer science journals with two female editors-in-chief and 15% female representation on the editorial staff.

Brouns and Addis (2004) also remind us of the influential role gatekeepers play as members of research councils, editorial and scientific boards, selection committees and peer reviewers and referees. Such gatekeepers are in a position to shape the criteria and development of scientific excellence, and to determine the allocation of resources and prospects for career development. The ETAN report (1999) confirms the general view that the majority of gatekeepers are middle-aged male academics. Given the huge responsibility these bodies hold it is worrying to note that most of these positions are filled in a rather informal and non-transparent manner (Husu, 2004).

Husu & Koskinen (2010) reviewed the gender composition of the research-funding arena of 13 EU countries and not surprisingly very few women were found at director or board level of national funding organisations. In instances where women are present as directors and board members, they occupy the highest leadership positions of Vice President, Chair and Deputy Director General. The Swedish and Finnish Science and Technology Research councils were the only funding organisations that had equal gender representation in the composition of their board members. The Spanish and UK funding organisations are showing positive movement towards gender equality in the composition of their boards. Towards the other extreme is the French National Institution of Research, where men direct seven of the eight departments and women only represent 21% of those responsible for the evaluation of research projects. In the Russian Federation, most funding organisations only have one female council member and nine of them have no female representation. In none of the countries did the proportion of women as evaluators surpass 30%. Once again, Finland and Sweden had the biggest portion of female evaluators at 27% and 28% respectively. The European Research Council (ERC) was created in 2007 as 'the first European funding body set up to support investigator-driven frontier research' with a budget of 7.5 billion Euros over a seven year period. The ERC is supposedly representative of the EU scientific community and science policies, but with an average of only 23% female gender representation among its members the picture is not encouraging (EC, 2009c).

Etzkowitz et al (2000) notes Austria as an example of a system starting to change due to the presence of women in decision-making and policy-influencing positions. Although there was already a push toward increasing the general participation of more Austrians in higher education, it was only toward the 1970s that this started to become a reality also for women. This gradual increase not only in the number of women in research, but also in rank was initiated by the Austrian women's movement bringing the debate of women and the role of research in national development to the agenda. This then gave rise to the establishment of a new Ministry of Science and Research in 1970, headed also by a female scientist, who in turn could influence policy insuring the promotion of women at the entry level of the research system. The Rector Conference, the national organisation of university heads, and also directed by a woman, went on to set up a working group to eradicate blockages to women pursuing careers in academic science at the top levels.

Having more women 'at the top' however could create another problem should the complete system not be addressed. Nearly twenty years ago Harding (1992:67) rightly highlights: *So, on balance,*

adding women to science strengthens an institution that should be weakened. Her concern is that when women are just added to the current male-orientated system it reinforces the sense of competing with men and does not address the source of the male domination. This in turn further intensifies the existing class and race divisions between women as these highly placed women no longer seem to criticise the system that oppresses their female colleagues working at lower levels. Such a system seems to benefit mainly white, Western, economically-privileged women; so merely addressing the issue of 'numbers' at the top is not enough. Attention should also be paid to the other challenges female scientists face such as the male-dominated nature of science and lack of recognition and reward to create an environment that eases and promotes the participation of women at all levels. Such a system will then eventually produce a steady flow of competent female scientists leading the SET domain and doing so in a truly representative manner.

Various authors (Brouns & Addis, Noordenbos, Gupta et al, Husu & Koskinen, EC) highlight the lack of female representation in leadership positions as one of the biggest challenges with regard to the relative unequal participation of women in SET. This implies that women have limited opportunity to display their skills, to influence the research agenda and the allocation of resources for research, and to drive gender issues. Although the gender composition of academies of sciences, scientific boards and publication boards are moving towards equality, this is happening at a very slow pace and the reality is that science to a large degree is still managed by a majority of middle-aged male scientists. On the other hand, just placing more women 'at the top' can also be counterproductive and often times just perpetuate the male-dominated nature of science. This particular challenge needs to be addressed on a policy and systemic level and in a holistic manner together with the other challenges to bring about an environment that can truly increase and facilitate the participation of women at all levels.

The United Kingdom's Strategy for women in SET (2003) lists a range of criteria for good SET employers. These criteria include: open and fair recruitment and appraisal policies; work-life balance policies; sexual harassment policies; diversity training at all levels; flexible working conditions – in other words job sharing, working from home, flexi-time; opportunities for networking with other women in SET; encouragement of female representation on professional association boards; mentoring programmes; and programmes that encourage female scientists to return to the field of science after a career break.

From what has been stated previously, much progress has been made to encourage the participation of women in SET, but from this list, it is clear that much can still be done to increase and enhance the participation of women in science.

2.3 CONCLUSION

If one considers that women make up more than half of the world's population, unfortunately also more than half of the world's most impoverished, together with the knowledge that gender equality

plays a positive role in economic growth and competitiveness, the importance of ensuring that women have both access and active participation in SET emerges. Furthermore, that the focus should extend past equal access to science to a form of participation that allows women to bring something distinctive to SET, precisely because of their gender. This would not just increase the number of people in SET but also contributing to the quality and agenda of science.

The literature would seem to indicate that even in instances where women are participating in SET the sexes experience and practice it rather differently. Such differences are then also highlighted in *section 2.1* of this chapter when explaining the research career of women in science by combining the pipeline and life-cycle/life-course approaches. The pipeline theory suggests that the career pipeline of women in science should be examined as a means of identifying weaknesses in the science system as a whole, together with strategies for addressing the under-participation of women. The life-cycle/life-course approach proposes a view of women's participation of SET throughout all stages of their lives, from their earliest school experiences up to eventual employment in science and this is illustrated as a pipeline transporting fluids. The speed of flow into scientific careers is calculated through transition points in the pipeline such as graduation, post-graduate studies and employment in SET. The pipe starts with a strong flow of young female graduates and along the way it seems to lose its power due to leakages and in the end is left with only a trickle, symbolising the few female scientists that have managed to secure prominent positions in science. The hypothesis then being that if these leakages can be identified and initiatives put in place to address them the flow would potentially increase – not just quantitatively but also qualitatively. This chapter of the study then aimed to answer the first part of the question: What are the 'leakages' or main causes for the relative unequal participation of women in SET?

The literature suggests that women working in SET in various parts of the world face the same challenges. For the purposes of this study the main causes for the unequal participation of women in SET are defined as (1) Unequal access to SET; (2) Male-dominated nature of science; (3) Tension of reconciling professional and private life; (4) Differences in reward and recognition; and (5) Lack of female representation in leadership.

Access

Access to SET was discussed in terms of two levels. The first being 'access to scientific information' measured by the access young girls have to primary education and science subjects. The conclusion can be drawn that much progress has been made in this area, although this particular challenge remains for various parts of the developing world. Alongside this are the social and cultural beliefs around concepts of masculinity, femininity, science and work that have to gradually be addressed. The second level of access is 'access to higher education' described in terms of female proportions in overall enrolment and graduation figures, PhD graduates and SET graduates. In terms of enrolments and graduations (all fields including SET) the trend is that women are overtaking men and even so at

post-graduate level, with the biggest inequality remaining at doctoral level. Promising though is that the number of female PhD graduates is increasing at a faster rate than that of male graduates.

Male-dominated nature of science

The male-dominated nature of science is portrayed from a quantitative (composition of SET work force) and qualitative (ease of participation) perspective. The statistics indicate that males are slowly losing their dominance (at least qualitatively speaking) in the SET workforce with the proportion of the female workforce growing at a steady pace and in some cases even exceeding the 50% mark. Qualitatively however the picture looks somewhat different, with women describing a work environment where men dictate the scientific agenda, the measurement of success, and the masculine qualities required to compete and progress in this arena. Concepts such as the 'male bonus', 'triple burden' and direct and indirect gender bias, as discussed in *section 2.2.2*, further underline this picture of an environment where female scientists often feel a subtle exclusion from informal networking, recognition and support from their male peers and leaders. The effect of this being either that women adjust their work ethic to a more masculine nature in order to 'compete and survive' or move on to other fields or environments that are better suited to their feminine nature.

Tension of reconciling professional and private life

The tension of reconciling a professional and private life is concerned with the link between women as professional scientists on the one hand and as partners and parents with domestic responsibilities on the other. The literature is somewhat inconclusive regarding this particular challenge. Some studies support the popular perception that a successful scientific career is not compatible with sustaining meaningful relationships that require certain domestic and other responsibilities; often resulting in female scientists postponing or not making such commitments at any stage of their careers. Other studies create the impression that when the necessary support structures are in place, such a work-life balance is achievable and in certain instances can even enhance the output and quality of work by female scientists. The reality is that a woman should not have to choose between her professional and private life (as this is mostly not the case for men) but rather be supported in this endeavour, as a content and balanced worker is a bonus to any employer. Alternatively the SET field will keep on losing highly skilled persons for shorter or longer periods, with financial and resource implications.

Reward and recognition

When it comes to the differences in reward and recognition, the literature is very clear about the difference in career opportunities for men and women working in SET. This is especially true in relation to the ability to access funding for further research (research funding success rate), the right to earn equal pay for equal work (salaries), possibilities for promotion, and recognition and award through prestigious fellowships and grants. The research funding success rate for women has increased substantially over the past 15 years, and especially so for EU-27 countries where there is in most cases awarding equality. The literature does however raise concerns about possible gender bias in the manner in which such rewards are made, often requiring women to 'out-perform' their male

peers in order to receive the same amount of funding. Across countries, some worrying trends are also emerging in that women are less likely than men are to apply for funding; are less likely to re-apply for funding; and apply to less prominent funds for a shorter period. In terms of remuneration, not a single example could be found where women are paid equally to men for the same type of work. Also, in order for the majority of women to be promoted the same principle applies as with the allocation of research funding; female scientist often times have to 'outperform' their male colleagues in order to be recognised and considered for promotion. Women are also poorly represented among recipients of the most prestigious scientific fellowships and awards and this is irrespective of their country or field of specialisation.

Leadership

Currently the biggest leakage (challenge) as regards the relative unequal participation of women in SET is the under-representation of women in key leadership and decision-making positions. This is evident from the gender composition of the membership profile of academies of sciences, scientific boards, and the publication boards of academic journals. This is a crucial aspect as it determines the ability of female scientists to influence the setting of the research agenda, the allocation of research funding and resources and to bring gender issues to the table when and as needed.

The conclusion is that much has been done to address the obvious equity challenges, particularly in relation to quantitative targets set for access and initial participation in the SET workforce. However, the biggest challenges remain once women become active participants. Although much progress has been made to address the male-dominated nature of science and the tension of reconciling a professional and private life, much awareness and systemic change is still needed to flesh out the subtle discrimination and inequality that remains. The biggest challenge is found in the lack of reward and recognition for women in SET and the lack of female representation in SET leadership.

This chapter has focused on the first question of the study: What are the main causes for the relative unequal participation of women in SET for a global perspective? *Chapter 3* will now provide a South African perspective of women working in SET.

CHAPTER 3**WOMEN IN SCIENCE, ENGINEERING AND TECHNOLOGY IN SOUTH AFRICA****3.1 INTRODUCTION**

This chapter provides an summarative overview of the situation that women working in SET in South Africa face as sketched by the available literature and data. First, a brief overview of the South African SET landscape is sketched as it relates to our history, race and gender. This is followed by a summary of developments at the national level regarding women in SET. The main causes for the relative unequal participation of women in SET are then reviewed as they apply to the South African context.

As Farquharson (2006) rightly points out there has been a substantial increase in the volume of international research on the state and status of women in science over the past 30 years; however, very little research has been done in South Africa. Some of the main studies include: (1) a chapter by J.A. Thompson on Women in science in M. Lessing (Ed) *South African women today* (1998); (2) report by Cheryl De la Rey entitled *A Review of the Experiences of Women in Higher Education in South Africa* (1994); (3) the National Research Foundation's (NRF) *Women-in Research Audit* (2001); (4) two reports by the Centre for Research on Science and Technology (CREST) on *Women in Science, Engineering and Technology in South Africa* (2004 & 2009); and most recently (6) *An assessment of the participation of women in SET industry* commissioned by the National Advisory Council on Innovation (NACI) (2008). H.E. Prozesky also published a doctoral thesis entitled *Gender differences in the publication of South African scientists* (US, 2006). The Council for Higher Education (CHE) has also produced a number of reports over the past ten years with some commenting on women working in higher education and the participation rates of women in tertiary education. The DST also annually conducts the *National Survey of Research and Experimental Development*, which provides a breakdown of scientists per sector of employment.

Due to the history of South Africa, the issue of gender and race cannot easily be separated – they are instead closely related and, in the South African context, often mentioned in the same breath under the umbrella of 'previously disadvantaged' individuals. The legacy of apartheid has resulted in a system typified by unequal access to education, wealth, and services with no acknowledgement of peoples' human dignity and worth. Since democracy was established in South Africa in 1994, much in this country has evolved around redressing this gap and the damage it has caused. South Africa's population currently stands at 50.5 million, comprising 79.5% African, 9% White, 9% Coloured and 2.5% Indian/Asian citizens. Some might argue that certain racial groups were more disadvantaged than others, but for the purposes of this study, African, Coloured and Indian/Asian South Africans are collectively referred to as Black South Africans, as it is believed these ethnic groups are all in need of redress in one form or the other.

Garson (2011) holds the opinion that South Africa does not only have a history of apartheid, but also the legacy of a patriarchal society where women (irrespective of race) have traditionally been viewed as inferior to men. As with apartheid, this gave rise to girls and women not being given equal access to education, wealth and services, subsequently affecting their ability to acquire certain skills and the level of education necessary for participation in various fields. This is detrimental to a developing country with a population made up of 52% women. At a political level, women in South Africa have made huge strides, moving from position 141 in the world in terms of gender equality in government in 1994 up to number eight in 2010, with 30% female representation in parliament and 40% representation at local government level. In addition, a number of national ministries, historically seen as male-dominated, have recently been led by women; these include Foreign Affairs, Public Works, Land and Agriculture, and Justice and Constitutional Development (Molebatsi, 2009). However, the social and economic battle for equality is far from over and both the apartheid and patriarchal system have left the majority of South African females facing issues of domestic and sexual violence, teenage pregnancy, early mortality due to HIV/Aids and limited access to further education and employment. Gender discrimination needs therefore be addressed at the same time as racial discrimination. In general, the view is held in South Africa that black women are the most marginalised group and that most of the redress needs to be focused on this particular grouping. As the report by Bailey et al (2004:23) might suggest *“relatively speaking, race has been effectively mainstreamed over the past nine years, while there are still significant gender imbalances in the system but little evidence of strategies to address these”*.

Apartheid has also left South Africa with a workforce proportionally overloaded with poorly paid lower-skilled employees on the one hand and with a very small pool of highly trained and skilled employees on the other. These groupings are still very much divided by race and gender, with the majority of unskilled labour being black and female and the majority of highly skilled and well-paid professionals being mostly white and male (NACI, 2008.) James (2006) also highlights South Africa's need for a more diverse skills base; one that more accurately reflects the demographics of all our citizens and one that is able to stimulate the participation of previously disadvantaged individuals, especially women in SET. There has been a significant increase in the number of women in various fields of employment in South Africa over the past ten to 15 years, with the majority filling temporary positions and located within the service and health fields at junior- and middle-management level. South Africa does not differ to the rest of the world when it comes to the underrepresentation of women in management and leadership positions.

In terms of the SET workforce in South Africa, the need for highly skilled scientists becomes evident from the following: *A range of strategies have been adopted and innovation-focused projects launched in the past five years that requires the participation of greater numbers of South African scientists and researchers. These include the Advanced Manufacturing Technology Strategy, the National Biotechnology Strategy, the SA Large Telescope and repositioning of world-class research institutions such as iThemba Labs. In this context, it should be noted that, given the current slow rate*

of replacement of the scientific workforce and the relatively low levels of participation of women, South Africa can only meet its growth and development targets if it addresses the barriers to more productive participation of women and black people in the scientific and engineering workforce (NACI, 2006:9).

Not only is there a shortage in the SET sector that needs to be addressed but also leakages from the current pool of workers. This leads to skills shortages that influence our ability to meet our country's development needs and our capacity to compete effectively in the global market. The SET sector is populated by highly skilled employees feeling marginalised by current employment equity policies, especially white South African men and women who have worked in certain industries for years and now often have to report to much younger managers with little or no experience, or are passed over for promotion in order to redress racial and gender quotas. The result is that many of these skilled employees move onto other fields where they feel their skills and experience are recognised and appreciated or in the worst-case scenario, they emigrate, leaving South Africa altogether. The South African science landscape is indeed affected by the increasing loss of skilled South Africans emigrating to other countries. This increase in emigration then also affects the current under-representation of women in SET, especially at senior levels. There is an increase in the percentage of professional women leaving South Africa (Bailey et al, 2004). The most common reported reasons for South Africans emigrating are crime, perceptions of high cost of living and taxation, and the perceived decline in the standard of public services. Other countries with competing economies also offer attractive salaries and career opportunities. The South African government is therefore challenged to find ways to keep skilled South Africans in the country.

Another relevant factor is the mobility of women from scientific to non-scientific careers. Women, and especially black women, are often times headhunted by other sectors in an effort to meet their employment equity targets. Each time the employee then moves on to a new sector a certain amount of resources and skills leave the profession with her, which has negative implications in financial terms, in trying to retain skills and for the transferral of knowledge to the generation of young women that are to follow (NACI, 2008).

The Women-in-Research Audit (NRF, 2001) attempted to produce a profile of female researchers across scientific fields and higher education institutions. The Audit also aimed to identify the needs of female researchers as well as the challenges they face when working in science. The Audit acknowledges South African higher education institutions as highly skilled in both research and teaching, but also stresses that there is still much to be done to redress the inequality brought about by our history. Such inequalities are seen where the majority of staff, especially at senior level, are still predominantly white and male. The majority of respondents to the Audit were in permanent positions (level of researcher) at higher education institutions and had been working in higher education for a considerable time. About 40% of respondents were enrolled for further studies (21% for masters degrees and 20% for doctorates), and surprisingly the majority indicated that these

studies were self-funded. Although they did not receive much financial support from their families, they did feel emotionally supported by their families who assisted with housework and childcare. The majority of respondents indicated involvement in the research structures of their institutions as well as some involvement in regional (27%), national (20%) and international (21%) research associations. A further 17% also reported serving on journal editorial boards.

A more recent study (NACI, 2008), commissioned by NACI, reviewed the perceptions, experiences and career histories of prominent women working in SET in South Africa. The women were from very different backgrounds, working in various fields and at varying stages of their careers. Some of the workplace challenges mentioned by participants, experienced especially during the early stages of their careers, included:

- The transition from tertiary studies to full-time employment and the lack of mentoring during this period;
- The perceived prejudice of older male colleagues regarding their physical and mental ability to perform certain tasks;
- The physical working environment not always making provision for female facilities;
- Negative comments about pregnancy and the impact this will have on their careers; and
- Men not always understanding the challenge of maintaining a work-life balance.

Interestingly the age of respondents and the type of responses provided does provide some indication that gender equality might be improving in the SET field. More than 70% of younger women (20-24 years old) felt that their working conditions made allowance for their gender. In addition, 90% of these young women felt that they had access to the resources and training they needed to successfully do their work, whereas this was only true for 50% of those in the 35-55 years age group. The older the respondents, the more negative the opinions were regarding the obstacles they face as women in their workplace (30% for 20-24 years old, 54.5% for 25-35 years old, 59.1% for 35-55 years old). The author does however leave us with the question whether this trend results from increasing gender equality or is due to a lack of reflection and experience on the part of young women entering SET. However, if this is true, it does say something about the newer generation of women who obviously feel that they can enter this field without even thinking that it would not be appropriate for a woman and about them being somewhat naïve to the challenges they might face. Much still needs to change in terms of racial discrimination as the majority of female respondents felt that black women were marginalised in their companies, often having to face barriers other women do not and sometimes without the necessary training and tools being provided for them to do their work.

Smith (2003) investigated the obstacles that women in the ICT sector feel they face in advancing to leadership positions within their field. Some of the themes that emerged are similar to those experienced by their female colleagues in other parts of the world highlighting once again a feeling that they have to prove themselves continually; having to always work harder and longer and know more than their male counterparts in trying to achieve the same recognition. The main barriers

identified by women working in ICT are the lack of female role models in the ICT sector and alongside this the masculine nature of ICT. Women also noted the fact that they are paid less than male colleagues for the same type of work and if they do receive the same remuneration then much more experience is generally required from the female employee. Participants also reported that their chances for career advancement would be jeopardised if they were to take a break to have children and those that already have children felt a constant stress between long inflexible working hours and family responsibilities at home.

The main legislative tool designed to drive gender issues in South Africa is the *National Policy Framework for Women's Empowerment and Gender Equity (2000)*. The policy provides an institutional framework for government and their various stakeholders driving the principle of equal access irrespective of race and gender and it is implemented as awareness-raising of gender issues, gender equality in service delivery; and promotion of gender equality in employment policies and practices. The framework *specifies the key institutional processes, role players, key partners, and mechanisms required to achieve gender equality in both the public and private sectors of the South African economy* (NACI, 2008:5).

Government structures particularly created to address gender equality and equity in South Africa are headed by a *National Coordinating Committee*, located in the Presidency, and are responsible for coordinating the *National Gender Programme*, which aims to steer and activate all ministries and provincial and local government towards integrated programme delivery. The Committee is chaired by the *Office of the Status of Women (OSW)*, with members from all levels of government and civil society, and is responsible for guiding Ministers and Director-Generals on gender analysis, development of national gender action plans and the implementation and evaluation of such plans. The effective implementation of such plans together with the overarching *National Gender Policy* is the responsibility of the *Gender Desks of Gender Focal Points (GFPs)*, located in the various national government departments. Parliament also houses two gender structures namely the *Women's Parliamentary Caucus* and the *Joint Monitoring Committee on the Improvement of Quality of Life and Status of Women (JMC)*. The Caucus is a multi-party grouping that aims to create opportunities for women in Parliament to debate gender issues and to build capacity around this issue. The JMC's functions include promoting the public participation of women in the law-making process; ensuring gender sensitive legislation as measured against international instruments; and monitoring government departments' implementation of gender equality and equity (James, 2006). The *Commission on Gender Equality* is an independent body created in line with the Constitution of South Africa to promote democracy with a specific focus on the advancement of gender equality. The Commission is responsible for reviewing all national legislation and policies through the lens of gender discrimination and advising government on adjustments needed to bring about gender equality in South Africa. In August 2008, the Southern African Development Community (SADC) Heads of State and Government signed the *SADC Protocol on Gender and Development*. The protocol is a legally binding document committing SADC member states to accelerate their efforts

towards gender equity in the region. The signing of the document symbolises not only a commitment from South Africa, but also from the region towards the elimination of gender discrimination and toward the attainment of gender equality (Molebatsi, 2009).

At primary and secondary level, the Gender Equity Directorate in the Department of Education aims to address the national need for SET skills by focusing on mathematics, science and technology education (MST) as a priority. James (2006) mentions that there are various initiatives taking place but also concerns about the lack of coordination and evaluation of such activities impacting negatively on the sustainability and long-term effectiveness of these efforts. Challenges that are more common within South Africa and other developing countries are the shortage of skills; limited financial resources; lack of infrastructure and equipment; and the language of instruction not always being suited to the learners needs.

At tertiary level, the National Plan of Higher Education (Department of Education, 2001) plays a critical role, with the aim of increasing the overall participation rate of South African school leavers in higher education programmes. Three of the main goals include: (1) *to increase the number of graduates through improving the efficiency of the system*, (2) *to ensure a balanced production of graduates in different fields of study*, and (3) *to increase participation and graduation rates of black and female students*.

At a national level the issues of increasing and enhancing the SET workforce in South Africa is steered by the DST. The *White Paper on Science and Technology* and the *National Research and Development (R&D) Strategy* both stress the lack of female representation in the SET field (Bailey, 2004). The R&D Strategy (DST 2002:55) indicates the basic requirements for a human development approach for SET that includes a clear gender dimension. These requirements include:

- A clear definition of what such a 'gender perspective' involves;
- Disaggregated statistics on women in the science system;
- Programmes that encourage previously marginalized groups to participate in science;
- A strong gender-inclusive policy in Centres of Excellence;
- The consolidation of current policies for women into a programme of empowerment for women; and
- The development of policy for women in science that is not punitive in respect of career development.

The strategy mentions particular initiatives aimed at promoting the participation of women in science. These interventions include activities such as:

- The provision of education subsidies to schools who produce female mathematics and science matriculants at the higher grade;

- The active marketing and promotion of science as an attractive and accessible career choice;
- Financial support for women wishing to pursue SET studies at higher education institutions at graduate and post-graduate level; and
- The strengthening of SET networks globally thereby ensuring the exposure of female students and researchers to the broader scientific community.

The Human Resource Development Strategy of South Africa (HRD-SA, 2009) commits to 'improve the technological and innovation capability and outcomes within the public and private sectors to enhance our competitiveness in the global economy and to meet our human development priorities.' The first strategic priority in this area (priority 6.1) is '*To increase the supply of skilled personnel in areas of science, engineering and technology*'. Outputs associated with priority 6.1 are: (1) an increase in the number of Grade 12 graduates with a result of 60% or more in Science and Mathematics; (2) an increase in the percentage of SET graduates as a proportion of annual higher education graduates; (3) a decrease in the number of unemployed science graduates; (4) an increase in the reach of science awareness campaigns; and (5) efforts to identify and nurture talent and potential in the fields of SET. Strategic Priority 6.2 is 'To improve South Africa's performance in areas of teaching, research, innovation and the commercial application of high-level science, engineering and technology knowledge'. Outputs associated with this priority are (1) to accelerate awarding of research chairs and specifically the research chairs in engineering; (2) to increase the number of students graduating with honours, masters and doctoral degrees in SET; (3) to increase the number of researchers per 1 000 people; and (4) to increase the percentage global share of research publications (DoE, 2009:41). Throughout the HRD-SA holds a strong focus on women, and particularly black women, as one of our most underdeveloped resources.

The DST is further guided by advice from NACI on the development of innovation in South Africa, including SET. NACI's website (<http://www.nacinnovation.biz/>) indicates that this advice should be directed at '*the coordination and stimulation of the National System of Innovation (NSI); promotion of cooperation within the NSI; structuring, governance and coordination of the S&T system; revision of the innovation policy; strategies for the promotion of all aspects of technological innovation, identification of R&D priorities; and funding of the S&T system*'. Science, Engineering and Technology for Women (SET4W) is an advisory committee of NACI established in 2003 to examine policy concerns in the areas of SET and gender. The committee consists of a team of experts who advise the Minister of Science and Technology on issues such as measures to increase the participation of women in science, technology and innovation (STI); gender mainstreaming in STI; monitoring the participation of women in STI; the establishment of networks and associations for women in STI; and informing the research agenda of STI from a gender perspective. DST with the assistance of NACI, SET4W and the NRF has commissioned the majority of studies focused on the participation of women in SET in South Africa and various conferences and workshops to debate and lobby this issue. Some of these include The *Women-in Research Audit* (2001); *Women in Science, Engineering and*

Technology in South Africa (2004 & 2009); *Creating the Future* (2006); and *An assessment of the participation of women in SET industry* (2008).

Creating the Future (NACI, 2006) proposes a gender, race and SET sector policy framework within which institutions in the South African national system of innovation (NSI) can implement effective measures for ensuring that South African women participate fully in, and benefit from, innovative SET research, production of SET products and provision of SET services. In terms of greater participation by women in particular the policy seeks to (NACI, 2006:2):

- Increase the number of women who enter, remain and advance their careers in all fields of SET, in particular to increase the scientific workforce by 3 000 productive women researchers by 2014;
- Ensure that more women scientists, engineers and technologists have access to and benefit from public funds earmarked for SET activity, research and innovation; and
- Strengthen inter-departmental collaboration on all issues affecting the professional growth and development of South African women scientists, engineers and technologists.

The policy proposes a twin approach of gender mainstreaming and the use of the Principle of Fair Discrimination to achieve this and that explicit targets and programmes should be put in place to this end. The policy indicates the various role players to assist in this endeavour as the DST, Department of Education, Department of Trade and Industry, Department of Labour, the NRF and all national research councils. It also proposes that public funding should be made available to these bodies to put such initiatives in place. The document also provides a Gender, Race and SET Monitoring and Evaluation Framework to potentially measure the extent to which the policy is being implemented across the NSI. The proposed measurement constructs are *SET potential*, *SET labour force*, *R&D workforce*, *Funding issues*, *Rank and employment*, *Scientific agenda setting*, *Scientific recognition*, *Scientific output* and *Scientific collaboration and networking*. More recently, the DST also announced its intention to establish a *gender equity policy* for the SET sector to be used as a tool to realise the goals in the National Policy Framework for Women's Empowerment and Gender Equity. In order to draft such a policy the DST has commissioned a range of studies focused on identifying challenges and solutions to the *effective recruitment, advancement and retention of women in the SET sector in South Africa* (NACI, 2008).

The main source of national funding specifically designed to increase and facilitate the participation of women in SET is the NRF. The NRF through the Thuthuka Programme provides the most noteworthy funding in SET as far as women scientists are concerned. The NRF is the funding agency for the parliamentary core grant and the Research and Innovation Support Agency (RISA) is the business unit within the NRF responsible for the administration of the grant. The DST distributes the grant via research and other grants for activities that fall within nine focus areas. RISA also administers another important source of funding for women in SET, although this is not so directly focused on gender. This programme is known as THRIP (Technology and Human Resources for Industry Programme). THRIP

funding focuses on collaborative research projects between higher education institutions and industry. THRIP is not focused on the funding of women researchers *per se*, but does emphasise the importance of an increase in the number of black and female students who follow careers in SET.

A number of the national research councils also provide funding to promote the participation of women in SET, and mostly within their particular field of specialisation. The *Medical Research Council (MRC)* is the second largest funding agency of academic research and scholarship in South Africa. Funding and support is limited to research in the health sciences. The MRC finances research by joint undertakings between the MRC and higher education institutions in the form of centres, units, groups or lead programmes organised around leading scholars. In 2003, there were 47 such programmes and women scientists managed 25% of these. The MRC also provides bursaries, scholarships and fellowships for post-graduate students and researchers-in-training. Between 2000 and 2003 more than 50% of such awards were awarded to female students (Bailey et al, 2004). This is followed by the *Council for Scientific and Industrial Research (CSIR)*, which has, as a part of its bursary strategy, a requirement that a minimum of 40% of their corporate-funded bursary recipients over a five-year period must be women. The *Agricultural Research Council (ARC)* provides funding in the form of an internship programme for Early Career South African Scientists. The programme pairs talented young South African scientists with mentors from the US Department of Agriculture Research Service (ARS) Units. The programme provides these young scientists with the opportunity to complete a post-graduate degree in any US-based university that is located near or is part of an ARS laboratory, while being mentored and supervised by an ARS scientist. The ARC also offers a Professional Development Project to young graduates by exposing them to the research methodology and management involved in the agricultural research environment, with a specific focus on previously-disadvantaged groups. The project also offers the support of a mentor and opportunities for further post-graduate studies.

From the above it is evident that there are good legislation and policies in place to improve gender equality in South Africa in general, but that implementation stays problematic. The main reasons stated by members of the Commission on Gender Equality for poor implementation are limited funding, lack of advocacy and lobbying, and that the majority of earmarked implementers are men, who are not always ready or willing to change the status quo (Garson, 2011). This gap was also highlighted at a recent conference (*Institutional Cultures and Higher Education Leadership: Where are the Women*, UCT, Cape Town, 2008) resulting in a declaration 'calling for a significant improvement in the representation of women in senior academic, administrative and executive leadership positions in all higher education institutions' (CHE, 2009:86). Bailey et al (2004) reports that although much legislation, policy and some funding is in place to address the shortage of women in SET, it would seem that the implementation of such intentions still lacks some focus, coordination and evaluation, although pockets of good work can be found.

The report of Women in SET by CREST (Bailey et al, 2004) has a subsection focusing on the initiatives for women in SET offered by various institutions in South Africa. The institutions that were surveyed included universities, science councils, national research facilities and national laboratories, one industry committee and a selection of international funding agencies operating in the country at the time of the survey.

The request for information to above-mentioned institutions included feedback on (1) any policies related to gender equity in general and more specifically focused on women as post-graduate students/researchers/scientists/academics; (2) recruitment policies and policies focusing on the promotion of women academics/researchers/scientists; (3) development programmes that aim to support women with work and/or study; and (4) funding mechanisms aimed at promoting women in SET, especially ones women wanting to study at higher education institutions or conduct research in the public sector. Criteria used for the evaluation of funding proposals and funding policies were requested. It would seem that most institutions are stressed to create an environment conducive to the increased participation of women in SET and to do so in an equitable fashion. Research capacity, resources and activity are also very unevenly spread across the institutions. An example of this is the case where most historically black universities are only now starting to focus on research as a primary activity and acquire the resources and human capital to do so, whereas their previous focus was primarily on teaching. Some institutions reported having no direct policies relating to gender equity and women in SET. Some also reported very specific gender equity policies, over and above employment equity or race equity policies. There were even a few institutions reporting set targets for the increased enrolment of female students. It is interesting to note that very few institutions reported any policies anticipated to increase women's participation in SET within fields that are conventionally male-dominated, such as engineering. Furthermore, there seems to be only partial support of how these policies translate into specific funding measures, capacity-building programmes, incentives or rewards for women working in SET. These findings are not just restricted to the public sector. In a recent study by NACI (2008), 16 industrial SET companies were surveyed and only one had a gender equity policy. A number of these companies reported spending large amounts on outreach and social development programmes to encourage the participation of women in SET, but no records are kept of the target groups or the intended and actual outcomes of the programmes.

3.2 MAIN CHALLENGES

Working women in South Africa, and women working in SET specifically, face the same challenges as their female colleagues in other parts of the world. When reviewing the main causes of the relative unequal participation of women in SET as highlighted earlier, the following section provides data that is unique to South Africa and will not repeat the issues that are necessarily similar worldwide. What does become clear is that South Africa has done well in addressing many of the glaring equity challenges and in terms of targets is progressing steadily. As is the case globally, the biggest challenges remain with regard to differences in recognition and reward and the lack of female representation in SET leadership. South Africa still has much to learn, especially from their European

counterparts, regarding assisting women in managing the tension of reconciling their professional and private lives.

3.2.1 Unequal access to SET

As highlighted in the previous section the issue of unequal access begins at the earliest possible stage of exposure to education. Female scientists, who took part in the NACI (2008) study focusing on the careers of prominent South African women working in science, reported that the support of their parents (especially fathers) and teachers and exposure to interesting science classes, fairs and activities at a very early age was crucial in establishing their interest in SET and the belief that they could succeed in this field. These women also recommended that interventions need to start as early as primary school and that young girls need to be exposed to science and women working in science, but also need to be encouraged to believe that they can succeed in this arena. Although the figures for education in Africa in general are shockingly low, and even more so for young girls, South Africa is one of the more progressive countries on the continent. Since democracy, the South African education system has put a lot of money and initiatives in place to address the issue of unequal access to education. Unfortunately the issue of access has become more closely linked to poverty and therefore access to education is not so much based on racial or gender terms but rather on the affordability of education and the ability of the state to provide educational facilities to all its citizens. The reality of the matter is that the majority of poor people in South Africa are black South Africans and therefore race does still enter the picture. Young black girls have however been embracing democracy and with it the dream that they can skill themselves for better opportunities than those offered to the generations before them. James (2006) reported that between 2003 and 2005 more young girls than boys were enrolled in the South African school system, a trend that has since persisted. More girls than boys are completing their schooling and the number of merit awards and distinctions is also higher for girls than for boys. Although this does point to the eager and progressive nature of young girls in South Africa, it is also sad to note that James believes that these figures are enhanced by the high dropout rate of boys who often leave the education system for jobs in unskilled or semi-skilled markets in order to financially contribute to their impoverished families.

In terms of access to higher education, the trends are much the same as in the rest of the world. In 1992, female enrolments made up 43% of all student enrolments and by 2001, this figure had increased to 53% (Bailey et al, 2004). The latest figures (*Table 3.1*) indicate a continuation of this steady growth rate, with female students making up 57.4% of all student enrolments in 2010. The same growth pattern is present for the total post-graduate student enrolments, with female student enrolments standing at 55% of all post-graduate enrolments in 2010. Unfortunately, the increase in female doctoral enrolments is much slower and female doctoral students only represented 42.2% of all doctoral enrolments in 2010.

In terms of the female proportion of SET enrolments, there has been a slight increase for both the total student enrolments and total post-graduate enrolments (45% each) but the proportion of female SET doctoral enrolments has stagnated at around 41% over the past five years.

Table 3.1: Student enrolments by degree and sex for South Africa (2005-2010)

<i>Enrolments in all fields of study, by degree and sex for South Africa (2005-2010)</i>									
	<i>Total student enrolment</i>			<i>Total post-graduate enrolment</i>			<i>Total doctoral enrolment</i>		
	<i>M</i>	<i>F</i>	<i>% F</i>	<i>M</i>	<i>F</i>	<i>%F</i>	<i>M</i>	<i>F</i>	<i>%F</i>
2005	334030	401042	54.6%	42611	51144	54.6%	5529	3905	41.4%
2006	332662	408718	55.1%	46168	50221	52.1%	5687	4141	42.1%
2007	338481	442402	56.7%	45171	50296	52.7%	5802	4246	42.3%
2008	348814	450651	56.4%	46748	54411	53.8%	5726	4266	42.7%
2009	359580	478175	57.1%	49045	58934	54.6%	6041	4486	42.6%
2010	380350	512573	57.4%	52102	63659	55.0%	6700	4888	42.2%
<i>Enrolments in SET, by degree and sex for South Africa (2005-2010)</i>									
2005	119098	91607	43.5%	14940	10878	42.1%	2405	1631	40.4%
2006	118930	92653	43.8%	15396	11309	42.3%	2607	1768	40.4%
2007	120099	94579	44.1%	15731	11695	42.6%	2768	1848	40.0%
2008	124695	100249	44.6%	16355	12699	43.7%	2789	1931	40.9%
2009	130115	106939	45.1%	17357	13767	44.2%	3000	2091	41.1%
2010	138589	112741	44.9%	18967	15283	44.6%	3354	2294	40.6%

(Source: DHET, HEMIS data:

<http://www.dhet.gov.za/Structure/Universities/ManagementandInformationSystems/tabid/419/Default.aspx>)

As mentioned earlier, redress in the South African context applies not only to gender but also to race and, as such, black females in South Africa have been the most marginalized. As Figure 3.1 shows, the percentage of black female enrolments has increased steadily over the past five years both for total female student enrolments and for female SET enrolments. Black females have managed to increase their proportion of the total female student enrolment up to 81.2% in 2010. Black female students have also increased their proportion of female student enrolments in SET to 78.6%. It is also encouraging that by 2010 black female students for the first time represented half of all female doctoral enrolments (for both total female doctoral enrolments and SET female doctoral enrolments).

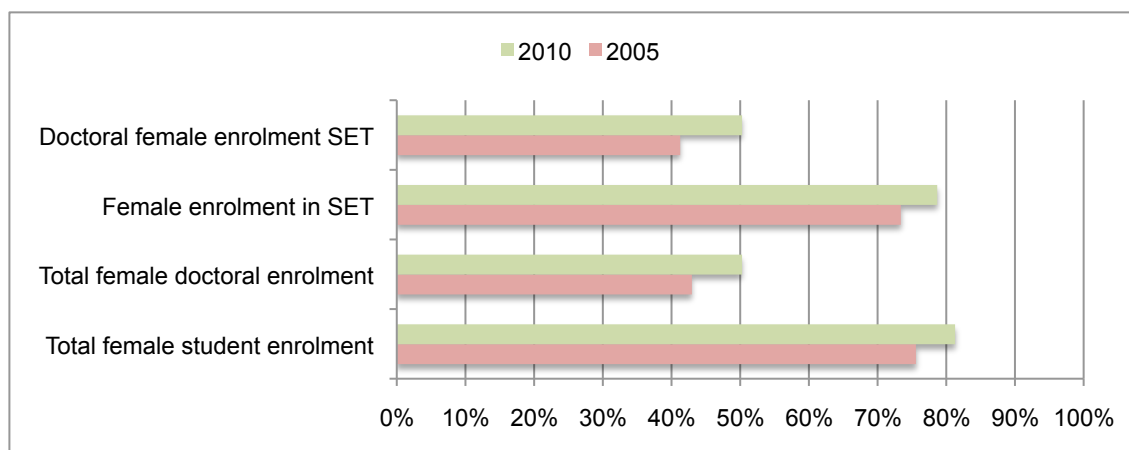
Table 3.2: Female student enrolments by level of degree and race for South Africa (2005, 2010)

<i>Female enrolments in all fields of study, by degree and race for South Africa (2005, 2010)</i>								
	<i>Total female student enrolment</i>				<i>Total female doctoral enrolment</i>			
	<i>White</i>	<i>Black</i>	<i>Total</i>	<i>% Black</i>	<i>White</i>	<i>Black</i>	<i>Total</i>	<i>% Black</i>
2005	97279	303763	401042	75.7%	2229	1676	3905	42.9%
2010	96318	416255	512573	81.2%	2436	2452	4888	50.2%
<i>Female enrolments in SET, by degree and race for South Africa (2005, 2010)</i>								
2005	24462	67145	91607	73.3%	959	672	1631	41.2%
2010	24072	88669	112741	78.6%	1142	1152	2294	50.2%

(Source: DHET, HEMIS data:

<http://www.dhet.gov.za/Structure/Universities/ManagementandInformationSystems/tabid/419/Default.aspx>)

Figure 3.1: Black female student enrolments (total student enrolments and doctoral enrolments) for South Africa (2005, 2010)



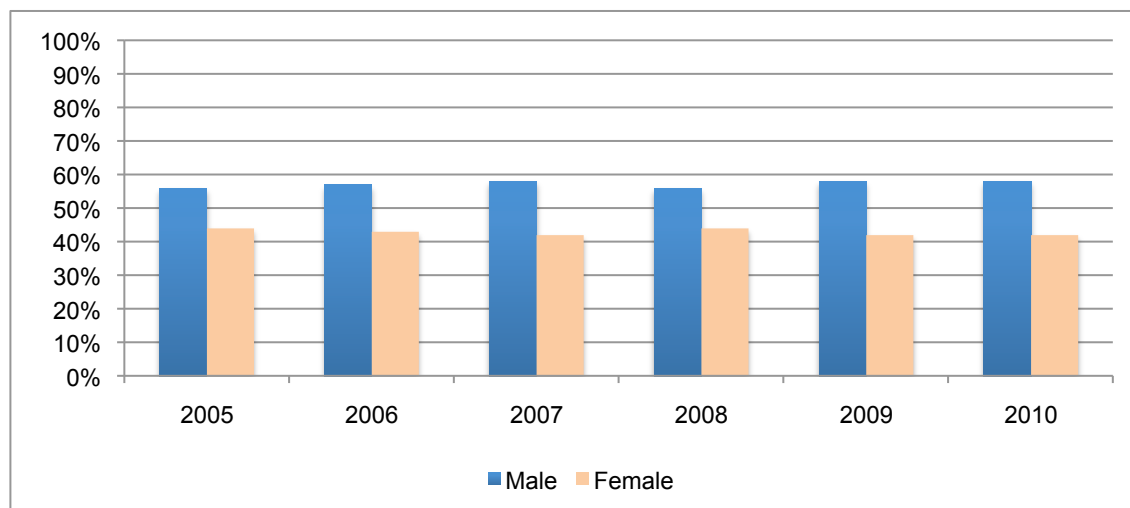
In 1992, female graduates constituted 48% of all graduates and by 2001, this figure had increased significantly to 58% (Bailey et al, 2004). Over the past five years, the proportion of female graduates has increased to 60.7% (Table 3.3). The proportion of female students of total post-graduates also increased from 53.2% in 2005 to 57.2% by 2010. Worrying however is the decline in the percentage of female doctoral graduates from 44.1% in 2005 to 41.9% in 2010 (Figure 3.2). This decline is also somewhat unexpected after the considerable growth in the proportion of female doctoral graduates from 38% in 2004 to 44% by 2005 (CHE, 2009).

Table 3.3: Graduates by degree and sex for South Africa (2005-2010)

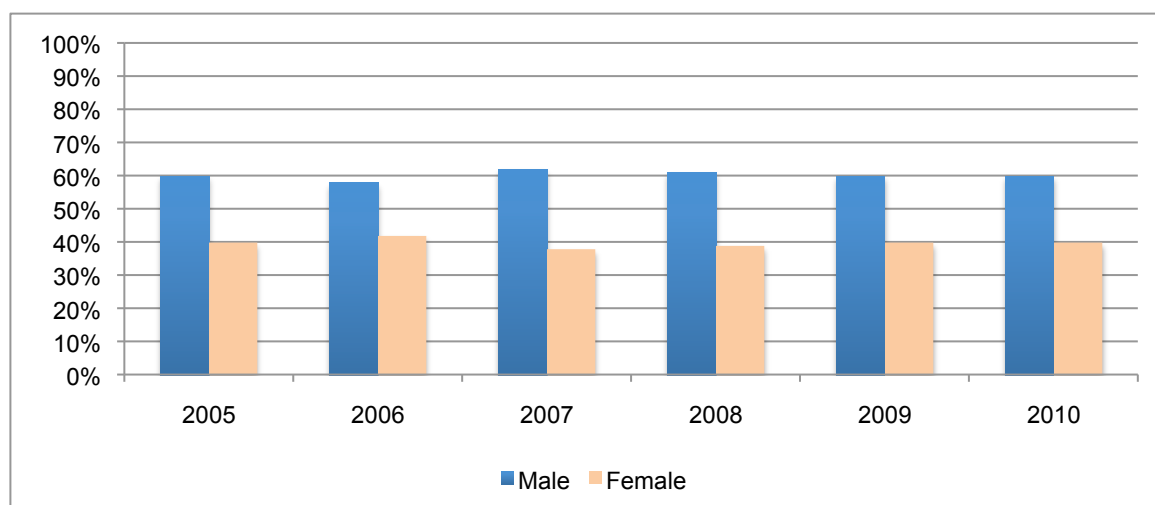
<i>Graduates in all fields of study, by degree and sex for South Africa (2005-2010)</i>									
	<i>Total student graduates</i>			<i>Total post-graduate graduates</i>			<i>Total doctoral graduates</i>		
	<i>M</i>	<i>F</i>	<i>%F</i>	<i>M</i>	<i>F</i>	<i>%F</i>	<i>M</i>	<i>F</i>	<i>%F</i>
2005	49540	70845	58.8%	11801	13433	53.2%	665	524	44.1%
2006	50691	73924	59.3%	11040	13251	54.6%	625	475	43.2%
2007	51773	74845	59.1%	10897	13598	55.5%	744	530	41.6%
2008	53921	79320	59.5%	11389	14390	55.8%	661	521	44.1%
2009	56779	88074	60.8%	11918	15565	56.6%	807	573	41.5%
2010	60260	93062	60.7%	13165	17612	57.2%	826	595	41.9%
<i>Graduates in SET, by degree and sex for South Africa (2005-2010)</i>									
2005	17125	16381	48.9%	3778	2857	43.1%	336	225	40.1%
2006	18216	17325	48.7%	3774	2940	43.8%	302	220	42.1%
2007	18492	17937	49.2%	3770	3035	44.6%	365	225	38.1%
2008	19642	19175	49.4%	4086	3294	44.6%	348	226	39.4%
2009	20662	20310	49.6%	4424	3623	45.0%	423	280	39.8%
2010	21755	21002	49.1%	4820	4018	45.5%	438	291	39.9%

(Source: DHET, HEMIS data:

<http://www.dhet.gov.za/Structure/Universities/ManagementandInformationSystems/tabid/419/Default.aspx>)

Figure 3.2: Proportion of total doctoral graduates per sex for South Africa (2005-2010)

For SET, female graduates have just about reached the 50% representation mark. As far as post-graduate women are concerned, their proportion also increased from 43.1% in 2005 to 45.5% in 2010. Despite these promising trends, the challenge remains at doctoral level with female doctoral graduates only representing 40% of all SET doctoral graduates (*Figure 3.3*).

Figure 3.3: Proportion of total SET doctoral graduates per sex for South Africa (2005-2010)

As is the case with graduate enrolments, black female students have managed to increase their proportion of the total female student graduates to 76.6% in 2010 (up from 70% in 2005) and for SET to 72.4% in 2010 (up from 63.3% in 2005).

Although the number of female doctoral graduates has also increased significantly for both total doctoral graduates and for SET female doctoral graduates (around 10% each), they are still not on a par with white female graduates and currently only represent 43% of female doctoral graduates (total female doctoral graduates and SET female doctoral graduates).

Table 3.4: Female graduates by level of degree and race for South Africa (2005, 2010)

Female graduates in all fields of study, by degree and race for South Africa (2005, 2010)								
	Total female student graduates				Total female doctoral graduates			
	White	Black	Total	% Black	White	Black	Total	% Black
2005	21262	49583	70845	70.0%	355	169	524	32.3%
2010	21767	71295	93062	76.6%	340	255	595	42.9%
Female graduates in SET, by degree and race for South Africa (2005, 2010)								
2005	6019	10362	16381	63.3%	147	78	225	34.7%
2010	5789	15213	21002	72.4%	167	124	291	42.6%

(Source: DHET, HEMIS data:

<http://www.dhet.gov.za/Structure/Universities/ManagementandInformationSystems/tabid/419/Default.aspx>)**Figure 3.4: Black female student graduates (total student graduates and doctoral graduates) for South Africa (2005, 2010)**

In terms of access the following statement summarises the current situation well: *The increase in the number of black and women graduates is hailed by the education system as representing a significant achievement made by government over the past decade towards widening access, encouraging equity and providing redress in education* (Molebatsi, 2009:38). Although this is true, equity as regards gender and race still requires a continued focus at the level of doctoral enrolments and graduations.

3.2.2 Male-dominated nature of science

The National Survey of Research and Experimental Development (R&D) is currently the only source that provides some sort of profile of the distribution of full-time researchers in the South African economy. The survey is conducted annually and has, since 2003, gathered data on key research and development indicators per sector (higher education, science councils, government, not-for-profit and business). Women as a percentage of researchers increased steadily between the 2001/02 and 2008/09 fiscal years; with 35.5% representation in 2001/02, 38% in 2003/04, 38.3% in 2004/05, 39.2% in 2005/6, 39.7% in 2006/07, and 40.3% in 2007/08 fiscal year (DST 2005, DST 2007, DST 2009a). The latest survey results, for the first time, indicate a slight drop to 39.7% female

representation for the 2008/09 fiscal years (DST, 2010). The 2007/08 R&D report (DST, 2009b) indicates that the majority of female researchers are placed within full-time researcher positions, with 17.7% found in technically supporting roles and the remaining 24% in generally supporting roles; which tend to be of a more administrative nature. Female R&D staff represents 56.3% of all R&D staff in the Not-for-Profit sector, followed by the government sector with 45.8% and the higher education sector with 43% of all higher education R&D staff being female. Women make up 40.7% of all R&D staff working for the science councils and the smallest proportion of female representation per sector is found in the business sector with 33.2%.

The limited range of available literature would seem to suggest that in South Africa, as is the case elsewhere, women are also confronted with the male-dominated nature of science, although to somewhat of a lesser degree. Interestingly the Women-in-Research Audit (NRF, 2001) reported that the main challenges highlighted by respondents were not gender specific and rather relate to limited time to effectively address all their academic commitments. To a lesser degree, issues such as family commitments, young children and the lack of childcare facilities (12%) were identified. Only 12% of respondents felt that they had to work harder than their male counterparts to receive the same reward and recognition and more than 50% felt that they had not encountered any sexism when applying for research opportunities alongside their male colleagues. However, 69% of respondents did indicate that they felt their male colleagues were unaware of the challenges female researchers might face. Half of the respondents also indicated having a mentor during the course of their research career and that these mentors were mostly male supervisors or department heads.

A NACI study (NACI, 2008) asked 90 women working in SET in South Africa to reflect on their experience of working in this field and almost 40% of respondents felt that their companies took note of the fact that they were female and tried to adjust their working conditions accordingly. The majority did however describe their jobs as stressful (61.1%) and 52.8% were of the opinion that they faced certain obstacles because of their gender, such as not being allowed to perform certain tasks due to the perception that their physical make-up renders them too weak to do so or that the task is seen as not 'being safe for a women'. In the same study more than 95% of respondents stated that they felt comfortable working with their male colleagues and that the feeling was mutual from the male perspective. This finding does seem to indicate that the South African SET field is making strides in the area of gender equality as such a statement would most possibly not have been the norm earlier on in our democracy. One notion mentioned in the South African study and not necessarily highlighted to the same degree in the international literature is the casting of women into supportive roles for men. Most senior staff members, including women, suggested that women are *expected to play supportive rather than substantive technical or professional roles in the SET sector* (NACI, 2008:42). They are often expected to perform the task of caretaker as they would at home, still being the one to see to the well-being of others, serving others and maintaining a measure of submissiveness.

As mentioned in *Chapter 2* the field of knowledge production could justify a complete study of its own, but this is not the key focus of the study. A brief glimpse at South African female publishing scientists does however reveal a picture much the same as that found in other countries. As can be seen from the above two sections, women in South Africa are fast reaching equity status in terms of access and employment in SET. The same however cannot be said for knowledge production. The latest figures (DST, 2009a) indicate that women only represent 33% of all publishing scientists and they only produced a quarter of all outputs by South African scientists for the 1995-2005 period. Female researchers that do publish are most prevalent in the health sciences, social sciences and humanities. The share of article equivalents produced by women averaged 25% between 2001 and 2005.

South African female scientists are gathering momentum and slowly starting to “infiltrate” the male-dominated field of SET. It is also promising that, although women working in SET in South Africa confirm the challenge of working within an environment that is dominated by masculine characteristics and expectations, they experience this to a lesser degree. The majority of women do experience the SET working environment as stressful but nevertheless feel comfortable working alongside their male colleagues.

3.2.3 Tension of reconciling professional and private life

As elsewhere, in South Africa female scientists report that one of the major challenges they face in their careers is maintaining a healthy work-life balance (NACI, 2008). South African women working in science indicated that in order to try and obtain this balance a few necessary requirements are:

- A support structure made up of family and friends and colleagues that are willing to help with household and childcare tasks, and even more so when they need to travel or work late;
- A partner that is supportive of their careers and preferably also has flexible working hours to assist with juggling home and work responsibilities; and
- A supportive work environment that provides for flexi-time.

Women who do not have life partners or children openly admitted that this does make it much easier for them to focus on their careers and to be available to work long hours and travel extensively when needed. Interestingly, although these challenges were mentioned, only 10.5% of the women felt that work-related responsibilities, such as travel, had a negative impact on their family life.

3.2.4 Differences in recognition and reward

The *Facing the Facts* report (DST, 2009a) used funding allocation datasets from the NRF and the MRC to portray the sex-disaggregated distribution of research funding to South African researchers within the public sector for 2001 and 2005. In terms of the actual awarding of masters and doctoral scholarships women’s proportion increased substantially from 42% in 2001 to 53% in 2005, while also receiving an equal proportion of the scholarship funding. The number of NRF grants awarded to

female researchers increased from 21% in 2001 to 24% in 2005, but the actual amount of funding decreased - from 19% in 2001 to 15% in 2005. The majority of scholarships and grants awarded to females were in the natural and agricultural sciences (62%), with the remainder being distributed among the engineering sciences and applied technologies (16%), social sciences (9%), health sciences (6%) and humanities (4%). Note must however be taken of the fact that the latest available figures are somewhat dated and that there possibly has been a positive shift in the funding amounts allocated to South African female scientists. The proposed Gender, Race and SET Sector Policy Framework (NACI, 2006:6) strongly advocates for *equity in the value of public funds allocated for R&D work conducted by women, as defined by both gender and race. This should include dedicated funds for women to be lead or principal investigators in order to enable women to compete in the various SET domains.*

Not much research has been done in South Africa regarding remuneration and gender equity in SET, in other words equal pay for equal work. The NACI study (2008) does however provide some perspective on the matter. More than 30% of female participants felt that they were not adequately rewarded for their labour; 50% that their male colleagues were more easily promoted; and 64% that men working at the same level were earning more.

The NRF rates individual scientists according to six rating categories: Category A, B and C for established researchers, category P&Y for young researchers and category L for rated researchers, which acknowledges researchers that have excelled despite being previously disadvantaged. Besides the recognition and status that comes with being a rated researcher the reward also comes in the form of funding as rated researchers in South Africa are eligible for funding for a five-year period every time they submit a successful application for rating to the NRF. When comparing the 2002 and 2005 figures (DST, 2009a) there was an average 12% increase in categories B, C, and P&Y since 2002, but no female A-rated researchers in either of these periods. It would seem that the primary focus of the NRF has been on redress, as the majority of researchers (62%) in category L were female, which represents a 29% increase since 2002 for this category. These high percentages are also explained by the following description of category L highlighting not only redress but also on women and specifically so 'returners': *This category was introduced to draw an increased number of researchers with potential from disadvantaged backgrounds as well as women into research. It also caters for persons previously established as researchers who have returned to a research environment after periods in industry or elsewhere. Applicants must demonstrate that they could not realise the potential or sustain their research ability by virtue of a lack of a research environment, or time spent in industry, or on maternity leave, or raising a family.* (<http://www.nrf.ac.za/projects.php?pid=115>). During the same period the bulk of female rated researchers were working in the health sciences (21) and natural and agricultural sciences (20). It is somewhat worrying to note that the one field with no female rated researchers, for either 2002 or 2005, is the engineering sciences and applied technologies. The proportion of rated black researchers has increased from 8% in 2002 to 17.1% in 2009. The proportion of female rated scientists are also

increasing, although slowly, from 17.9% in 2002 to 27% in 2009 (NRF, 2010). Although the proportion of female rated researchers is not so impressive the numbers have more than doubled for this period from 227 (2002) to 514 (2009).

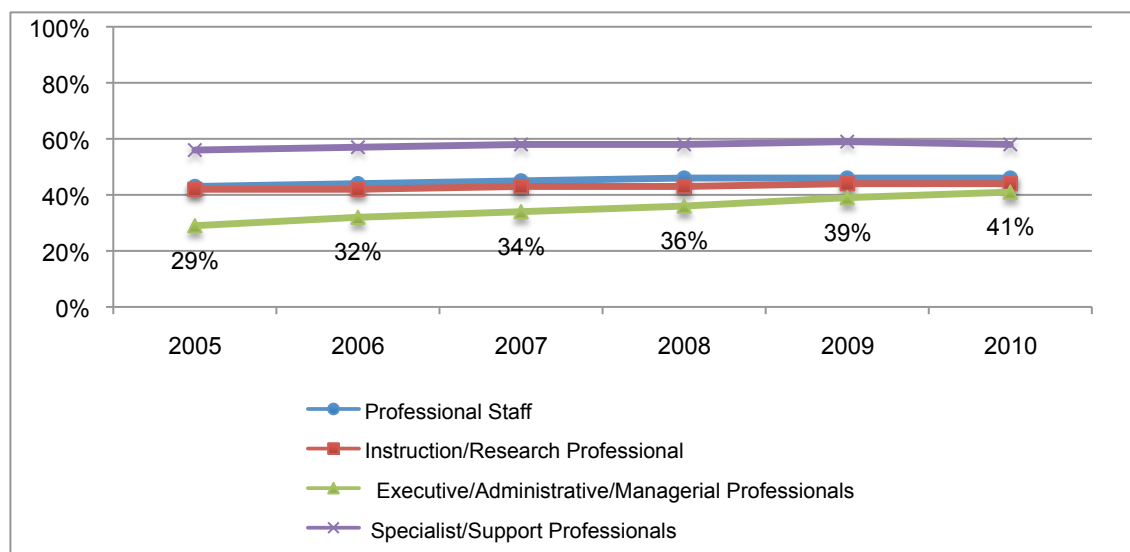
The conclusion regarding differences in recognition and reward for women working in SET in South Africa is much the same as those highlighted for other parts of the world in *Chapter 2*. Proportionally women receive a bigger slice of the pie of the available research funding although the value of the funding has not necessarily increased at the same rate. Although no actual South African statistics are available regarding remuneration for women in SET, the general perception is that they are not rewarded equally for the same work as their male peers. Encouraging on the one hand is the recognition South African female researchers are receiving, evident from the increase in the number of NRF female rated researchers. What is worrisome, however, is that these ratings are still at the lower levels and there are no A-graded female scientists.

3.2.5 Lack of female representation in leadership

Bailey et al (2004) reported a consistent increase in the number of female staff from about 30% in 1992 to about 40% in 2001 at South African universities and technikons. The report further indicated that female staff, within the higher education sector, were represented by women younger than 35 years of age and that the percentage of female research staff at universities had significantly increased in all ranks. In 2001, women were still under-represented at the upper ranks, but the data indicated that women are improving their representation in the HE system and if the trend continues, there would eventually be equal representation of both genders in the most senior positions. Bailey et al was correct in this assumption to some extent and by 2005 the proportion of female professors at higher education institutions increased to 19% from the 14% noted in 2001 (DST, 2009a). Increases were also noted at the rank of associate professor (26% to 30%) and senior lecturer (36% to 40%). The CHE reports that by 2007 women constituted 51% of all staff at public higher education institutions, but that men still hold the majority of top-ranking academic and management posts, while women dominate the supporting and administrative roles. Promising is the increase in the proportion of women in senior management positions, from 18% in 2004 to 36% in 2007 (CHE, 2009).

NACI (2008) reports that in the review of 16 industrial SET companies, females were in the minority of employees, particularly black women, and most noticeably at executive and management level. Although not relevant only to the SET sector, the South African Women in Corporate Leadership Census reports on the representation of women on boards of directors and in executive management positions of public companies in South Africa. The 2009 Census found that women only held 7.1% of board directorships and of these only 3% were chairs of boards and only 1.9% were chief executive officers of their respective companies (Molebatsi, 2009).

Figure 3.5: Proportion of female professional staff members at higher education institutions in South Africa (2005-2010)



(Source: DHET, HEMIS data:

<http://www.dhet.gov.za/Structure/Universities/ManagementandInformationSystems/tabid/419/Default.aspx>)

The latest figures (DHET website, 2010) indicate that female staff at South African higher education institutions now represent 53.3% of all staff members. Furthermore, they are also increasing their presence in the upper ranks with 46% of all female staff ranked as professional staff members (up from 43% in 2005) and the remainder as non-professional staff. The Department of Higher Education and Training (DHET) also classifies professional staff as instruction/research professional (academic staff at top level), specialist/support professional (academic staff at lower level), and executive/administrative/managerial professionals (decision-making roles). Between 2005 and 2010 all three categories have increased their proportion of female representation. Specialist/support professionals and instruction/research professional both increased slightly (from 56% to 58% for support professionals and from 42% to 44% for research professional). Highly encouraging is the substantial increase at executive/administrative/managerial level from 29% in 2005 to 41% in 2010.

3.3 CONCLUSION

Although the volume of international literature on the participation of women in science has increased substantially over the past thirty years, this is still a relatively new field of study in South Africa. However, given our history, issues of discrimination and inequality cannot be ignored and redress in terms of race and gender are increasingly receiving attention. The current workforce, particularly the SET workforce, is dominated by men and hampered by a shortage of highly skilled persons (irrespective of gender or race), as well as a leakage of such skills to other industries and other countries. A range of strategies, legislation and government structures have been put in place (as described in *section 3.1*) to address these particular characteristics but despite these good measures implementation remains a huge challenge. Possible reasons for this include limited funding; lack of a

culture of advocacy and lobbying; lack of focus and coordination; and the reality that many of the implementers are men who are not always willing to challenge the existing state of affairs.

As can be seen from the challenges listed by women working in SET in South Africa during a recent study (NACI, 2008), our challenges are much the same as those in other parts of the world, with the addition of racial redress as influenced by our political history. Challenges mentioned by participants included the transition from tertiary studies to full-time employment and the lack of mentoring during this period; the perceived prejudice of older male colleagues regarding their physical and mental ability to perform certain tasks; the physical working environment not always making provision for female facilities; negative comments about pregnancy; and the impact this will have on their careers; and men not always understanding the challenge of trying to maintain a work-life balance.

In terms of unequal access, the same growth patterns are observed in enrolments and graduations (SET sector and others) for South Africa as elsewhere in the world, although at a slightly slower rate and the gap remains substantial in terms of female PhD graduates. In terms of equity and redress the increase in the number of black female enrolments and graduates is especially encouraging.

As regards the male-dominated nature of science, South African women are here also gaining ground and increasing their proportion of the SET workforce. Although South African female scientists work in the same SET environment characterised by certain masculine features and standards of success, they report finding that this is stressful but still feel comfortable working alongside their male colleagues. In terms of racial discrimination, black women often report still feeling marginalised and having to face barriers other women do not and sometimes without the necessary training and tools provided for them to do their work.

It would also seem in general that South Africa women are somewhat more positive regarding the challenge of maintaining a healthy work-life balance, with South African women reporting that the challenge is huge, but they feel it is manageable when the necessary support structures are put in place.

As elsewhere in the world, women working in SET in South Africa are not equally recognised and rewarded. Although women are receiving a bigger portion of available research funding, the value of individual rewards has not necessarily increased accordingly. Furthermore, although no statistics are currently available the general perception exists that female scientists are not remunerated equally for the same type or quality of work as their male peers.

As is the case worldwide women are underrepresented in leadership positions in SET and this remains one of the most sensitive and crucial challenges to address. Promising however is the continual growth in female representation in the upper ranks of the higher education sector in South

Africa. If government and the private sector should follow suit at the same pace, this shortfall could be addressed significantly in the near future.

The remaining chapters will focus on the general and empirical findings about what initiatives are in place to increase and facilitate the participation of women in SET and some resulting contributions and recommendations.

CHAPTER 4**INITIATIVES TO INCREASE AND FACILITATE THE PARTICIPATION OF WOMEN IN SET**

The chapter sketches the need for a holistic life-cycle approach in addressing the equal access and participation of women in SET. Such an approach would involve various role-players, resources and activities at different levels of intervention over a lengthy period. Against this backdrop, a general overview is given of the most common levels and modes of interventions used in the field as they relate to (1) policy interventions; (2) gender mainstreaming; (3) the role of advocacy and interest groups; and (4) the provision of training and support.

Examples of policy interventions are presented at regional, national and institutional levels with a particular focus on the role of the European Commission (EC) at the European level. Gender mainstreaming as a mode of intervention is discussed with reference to terms such as horizontal and vertical mainstreaming, and gender budgeting. Examples of successful mainstreaming efforts are also provided. The discussion highlights the fact that policies and mainstreaming measures are in many cases the first and most effective way of increasing and facilitating the participation of women in SET, but that often additional action is required and this is mostly driven by advocacy and interest groups. The provision of training and support is discussed and highlighted with examples of mentoring (electronic and face-to-face) programmes; the use of role models; and in-service and support programmes.

As the literature and the initiatives database (as reported on in *Chapter 6*) show some bias towards the government and higher education sector the chapter ends with a brief overview of promising activities taking place in industry to increase and facilitate the participation of women in SET.

4.1 INTRODUCTION

Haataja et al (2006) comment that although numerous initiatives have been designed and developed to increase the participation of women in SET, most of these actions are of a corrective nature - either trying to help women adjust to the existing environment or forcing the environment to accommodate women. Very few, if any, truly take a 'preventative' approach that aims to bring about long-term structural change using a life-cycle approach as its underlining base. Haataja et al recommend such a life-cycle approach in that it is holistic in nature and cuts across both types and levels of intervention. The life-cycle approach should be implemented in all education, training and employment systems, with every level addressing gender and equality along a continuum of learning and development. Lane (1999) supports this view by also advocating a holistic approach with strategies and actions directed at school and tertiary level as well as at the work place. Achmad (2000) further breaks down the strategic role-players into governments, legislators, scientific societies at national and international levels, intergovernmental and non-governmental organisations, SET funding institutions, civil society (social, traditional and religious organisations), the media, parents and teachers. This implies a team effort from the educational system, government and industry. There needs to be a combined focus on

objectives, renewed administrative structures and positive actions. The conclusion being that strategic planning, supporting structures and precise activities are required on national, institutional and grassroots levels, including all relevant role-players, to ensure significant impact.

Lane (1999) and Bonder (2000) recommend that, at the systemic level, the first requirement would be to secure the political will and necessary financial investment from governments and national and international organisations to design and roll out policies and programmes focused on addressing the equal participation of women in SET. Examples of such initiatives, which have been instrumental in bringing about a shift in the SET landscape, are funding policies and programmes that encourage and reward the participation of young girls in SET subjects at school and tertiary level; prescriptive percentages for female participation in research projects in institutional and workplace settings; and required female representation on SET decision-making bodies. The importance of raising public awareness and support for the equal participation of women in SET, alongside these policy processes, is also required. This is often driven from a national level and implemented by various institutions and organisations through means of awareness-raising and advocacy projects. Bonder also stresses the importance of regional exchange and cooperation. The success of such an approach is evident from the results produced by the EC as presented in *section 4.2.1*. Continual monitoring and evaluation of the implementation of such policies and programmes is vital in order to measure progress and to indicate when new indicators and direction are required to address the challenge of equal participation in SET.

At institutional and workplace level, formal and informal structures are required to promote and protect the right of female students and staff to equal access and participation. Formal structures refer to institutional and human resource (HR) policies and practices that are gender sensitive and enforce issues such as gender mainstreaming, equal financial reward and promotion systems for all genders and family-friendly policies (Lane, 1999). Bonder (2000) also stresses the importance of human resource management being trained and focused on gender issues with established gender equality plans consisting of goals, objectives, indicators of success, identification of role-players and realistic timelines. Informal structures are primarily focused on providing the necessary support to female students and staff to facilitate participation. These include networking and mentoring and training programmes that equip women with the necessary knowledge, skills and support to survive and compete in the SET environment.

Haataja et al (2006) strongly believe that when addressing change, and in this case also the shifting of longstanding attitudes, expectations should be realistic in that initiatives may only have a meaningful impact after a decade or more. In addition, such change can only be realised if there is full participation and commitment from all role-players at each level of engagement.

To a large extent the above reflects the ideal in addressing the challenge of increasing and facilitating the participation of women in SET and surely this is what all countries and institutions on various

levels are working towards. Keeping this in mind the following section reflects on the existing types or categories of initiatives aimed at increasing and easing the participation of women in SET. A general overview is given of the most common levels and modes of interventions used in the field as they relate to (1) policy interventions; (2) gender mainstreaming; (3) the role of advocacy and interest groups; and (4) the provision of training and support. A brief overview is also given of promising activities taking place in industry to increase and facilitate the participation of women in SET.

4.2 INITIATIVES

4.2.1 Policy interventions

The following section illustrates the influence of policy formulation and implementation as a mode of intervention in addressing the unequal participation of women in SET. As stressed in *section 4.1*, such interventions need to take place at various levels to have any meaningful and lasting impact. Examples of policy formulation and implementation are presented at regional, national and institutional level.

Internationally, scholars and policy makers agree that the first step towards achieving gender equality in all fields of employment and spheres of life generally, and in the SET sector in particular, is to develop and institute an adequate social infrastructure and policy environment that makes it easier for women to enter the employment arena, get access to promotion and remain employed (Moletsane, 2008:19).

In countries where there is evidence that governments value research and that gender equity is a national priority, good policies accompanied by good practices are the norm (EC, 2008). Internationally instruments such as the Convention for the Elimination of Discrimination against Women (CEDAW) and the Millennium Development Goals (MDGs) have been guiding the way towards ensuring equal opportunities for women in all areas of life and work. Sweden and Norway are seen as the current leaders in the move towards gender equality (EC, 2009c). In these countries, gender equality is entrenched in the society and culture both in the political and social arena.

In Sweden, for instance, gender equality is no longer just a women's issue, but rather a policy area that needs to be considered in all decisionmaking at all levels of governance, and is driven by both men and women. Since 1992 all official statistics must be provided in sex-disaggregated format and since 1994 gender equality is required to be mainstreamed into all policy areas.

Regional level

The EC has arguably been the most influential body in promoting an understanding of the realities faced by women working in SET and in setting policies in place to increase and facilitate the recruitment, promotion and retention of women in SET at a regional level. Europe has led the way with policy measures aimed at increasing and facilitating the participation of women in SET. The EC has played a crucial role as it has commitment from national governments and institutions. *Table 4.1*

gives a brief overview of the main policy documents followed by a description of the resulting policy developments initiated by the EC over the past 10-15 years. A more detailed description is presented in *Appendix A*. During this same period, much happened in individual countries, often as a response to these initiatives, and by no means are they less important – the scope of the study does however not allow for an overview of all policy developments and therefore this EC overview is seen to be the most representative at a European level.

Table 4.1: EC Women in SET Policy documents

Date	Policy document	Summary
1998	ETAN Report (Science Policies in the European Union “Promoting excellence through mainstreaming gender equality”	The report reviews the position of women in S&T. It concludes that the under-representation of women threatens the goals of science in achieving excellence, as well as being wasteful and unjust. The report makes recommendations to a wide range of bodies, including the Commission, the European Parliament, the Member States and organisations that educate, fund and employ scientists.
1999	Women and Science: “Mobilising women to enrich European research” report	The report reflects that the under-representation of women in research is the result of a large number of very varied factors. As a response the Commission undertakes to pursue two objectives: (1) To stimulate discussion and the sharing of experience in this field among the Member States; and (2) To develop a coherent approach towards promoting women in research financed by the Union, with the aim of significantly increasing the number of women involved in research.
2002	National policies on women and science in Europe	The report describes existing national policies and practices aimed at promoting the participation of women in science in 30 European countries represented by the group including networking, quotas and targets, role models and mentoring, earmarked chairs, research funds and prizes.
2003	Women in industrial research – A wake-up call for European industry	This report was aimed at filling the gap in the lack of available information concerning the situation of women in industrial research, providing a review and possible strategic direction. It constitutes a starting point in terms of outlining actions to be taken and identifying areas for further investigation.
2003, 2006, 2009	She Figures	She Figures is published for the first time in 2003, consisting of a compilation of key data on the participation of women in science at tertiary and employment level. This document for the first time makes available the sex-disaggregated data on human resources in the European Research Area (ERA). Subsequent reports were produced in 2006 and 2009.
2004	Waste of Talents - Turning private struggles into a public issue	The Research Directorate-General commissioned this report in order to assess the conditions and status of women scientists in the Central and Eastern European countries and the Baltic States. It reveals the large proportion of highly qualified women scientists working in the research institutions of the Enwise countries in very poor conditions.
2004	Excellence and Innovation – Gender Equality in Science	The report gives an overview of women and science actions implemented at European level since the Council Resolution and of the results achieved. The report demonstrates that although some progress has been achieved since the adoption of the previous reports in 1999 and 2001, various challenges still remain.
2006	European Charter for Researchers and Code of	The Charter is a set of general principles and requirements, which specify the roles, responsibilities, and entitlements of

	Conduct for the Recruitment of Researchers	researchers as well as that of employers and/or funders of researchers. The aim of the Charter is to ensure that the nature of the relationship between researchers and employers or funders is conducive to successful performance in generating, transferring, sharing and disseminating knowledge and technological development, and to the career development of researchers.
2007	Study on the remuneration of researchers in the public and private commercial sector	The main purpose of the study is to have a clear picture of the remuneration of researchers in Europe (EU25 and Associated Countries). The study collected information on the gross and net remunerations of researchers in the public and private commercial sectors. The study also discusses researchers' career recognition, which seems to have fallen behind compared to other professions.
2007	Mid-Term Assessment of Science and Society Activities	At European level, "Science and Society" was a new initiative that was undertaken under the Sixth Framework Programme (FP6). Its main objectives were formulated in the Science and Society Action Plan, which led to a broad range of activities numbering about 150 projects, conferences and forums.
2008	Benchmarking policy measures for gender equality in science	The report provides an update on the national policies and on the statistical profiles of the 33 countries represented in the Helsinki Group, and it introduces for the first time data from the Western Balkans. This report builds on the previous one and evaluates the policies and measures with indicators measuring the presence of women in science.
2008	Mapping the Maze: Getting more women to the top in research	The report examines and describes in detail nomination procedures, obstacles, facts and funding limitations that women need to overcome in their academic careers. Based on this analysis, the report proposes recommendations to facilitate the design of a framework for better targeted actions at European level, and highlights the problem of poor awareness and visibility. The report also makes suggestions as to how the prevailing scientific culture could change to become more inclusive.
2009	Gender challenge in research funding	The Gender and Excellence expert group was set up to provide recommendations on the improvement of transparency in the procedures used in selection committees for the award of grants and fellowships and in access to research funding in general. The report provides national data for all 27 Member States and six Associated Countries. This European-level synthesis highlights the existence of good practices in the field of transparency and accountability of research funding systems that could be applied in other settings.

Sources:

ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_etan_en_200101.pdf

ftp://ftp.cordis.europa.eu/pub/improving/docs/g_wo_co_en.pdf

http://ec.europa.eu/research/science-society/women/wir/pdf/wir_final.pdf

<http://www.rsme.es/comis/mujmat/documentos/enwisereport.pdf>

http://ec.europa.eu/research/science-society/pdf/documents_women_sec_en.pdf

http://www.upr.si/fileadmin/user_upload/RK_RS/RK_RS_angleska/am509774CEE_EN_E4.pdf

http://ec.europa.eu/eracareers/pdf/final_report.pdf

http://ec.europa.eu/research/science-society/document_library/pdf_06/mapping-the-maze-getting-more-women-to-the-top-in-research_en.pdf

http://ec.europa.eu/research/science-society/document_library/pdf_06/gender-challenge-in-research-funding_en.pdf

When the EC started investing in the particular subject of women in science, the first few years focused on determining the situation of women in science and encouraging gender mainstreaming as a tool to address the perceived unequal participation of women in SET. In 1993, the EC commissioned a study to determine the position of women in scientific research within the European Community and hosted its first international workshop on the topic of *Women in scientific and technological research in the European Community*. On reviewing the findings, the EC was requested to investigate (a) the collection and comparison of statistical data, (b) the development of an action programme for women in S&T research; and (c) to consider the use of European Structural Funds to support women in S&T to increase participation, promotion, and access to grants. Alongside these focus areas, the issue of gender mainstreaming was also highlighted during the 1995 Beijing Fourth World Conference on Women, which produced a gender equality objective of ‘incorporating equal opportunities for women and men in all community policies and activities’. The EC subsequently adopted a mainstreaming strategy in order to pursue this objective, which entailed the mainstreaming of gender into all EC policies, and subsequently also into research.

The EC hosted its first *Women in Science Conference* in 1998 where it announced its investment and intention to promote specific activities to increase the participation of women in research. In the same year, the European Technology Assessment (ETAN) Working Group on Women and Science was set up by the EC and mandated to produce a report on the situation and challenges for women’s participation in European research policy. The final report, entitled *Science Policies in the European Union – Promoting excellence through mainstreaming gender equality*, proposes legislative change in member states in favour of women in science; an example would be the obligation of employers to keep sex-disaggregated data. The report was approved by the European Parliament, experts and stakeholders in the field and was followed up by the *Women and Science: Mobilising women to enrich European research* report in 1999. This publication defined the first objective of the EC in the policy field as ‘to stimulate discussion and sharing of experience in this field among Member States’. This indicated a subtle shift in focus with gender mainstreaming and access remaining important, but also acknowledging that the ease of participation and variation in experiences between sexes and countries was very real.

At the 2000 *Women and Science: Making change happen* conference, the Helsinki Group on Women and Science was created as a response to the ETAN report. This group brought together national representatives from all EU Member States to develop statistical profiles and equality indicators through the creation of a sub-group of statistical correspondents. The Helsinki Group produced almost immediate results and in 2001, the EC reported to the European Parliament and Council on the results achieved since the adoption of the ETAN report, such as the establishment of national steering committees on women and science. The European Council responded by inviting the EC to propose an action plan on ‘science and society’ specifically in relation to the ‘women in science’ issue. The Council further invited the EC to: *continue and intensify its efforts to promote the role of women in science and technology, and to ensure an effective mainstreaming of the gender dimension when*

implementing the 6th Framework Programme (2002-2006) and developing the European Research Area; promote gender equality in those areas dealing with human resources and mobility activities; pay particular attention to the gender dimension in benchmarking activities. It also invited the Member States and the Commission to support the Helsinki Group in continuing its work, and to deepen cooperation to promote the role of women in European research. In addition, the policy approach needed to be complemented by specific research to improve the understanding of gender and science issues in Europe, and tools needed to be developed to support the policy process (EC, 2010b:18).

The Women and Science Unit of the Director General Research was launched in the same year, 2001, at the *Gender and Research Conference* with four new initiatives namely (1) the creation of a European platform of women scientists; (2) the production of a set of gender indicators; (3) analysis of the role and place of women in research carried out in the private sector; and (4) an analysis of the situation facing women scientists in Central and Eastern Europe and the Baltic States. As a result, a *STRATA-ETAN Expert Group*, comprising academics, gender experts, representatives from the business sector and HR representatives, was established to review the participation of female researchers in the private sector. This resulted in the publication of *Women in industrial research – A wake-up call for European industry* (2003) reviewing options through which the private sector could increase the participation of women in research for their sector. Furthermore, the *Enlarge Women in Science to the East (ENWISE)* group was established for the purpose of reporting on the conditions and status of female scientists in the Central and Eastern European countries, the Baltic States and the new Eastern Lander of Germany. At this conference, the Helsinki Group for the first time highlighted the need to “*modernize the scientific career system that will encourage mobility and flexibility and a better work-life balance*”.

The year 2002 marked a shift in focus towards the effective recruitment, promotion and retention of women in science careers. The Helsinki Group published *National policies on women and science in Europe* – describing existing national policies and practices aimed at promoting the participation of women in science in 30 European countries represented by the group. These practices and policies included networking, quotas and targets, role models and mentoring, earmarked chairs, research funds and prizes. This was supported by the 6th Framework Programme’s (FP6) specific budget dedicated to women in science activities, including a total of 15 million Euro to be spent on projects to network and raise gender awareness; to encourage young women to consider scientific careers; and on gender research and gender mainstreaming in research. For the first time the FP6 proposals also required the inclusion of a Gender Action Plan (GAP) outlining activities aimed at promoting gender equality.

She Figures was published for the first time in 2003, consisting of a compilation of key data and presenting up-to-date figures on the participation of women in science at tertiary and employment level. As the EC states (2010:21): *The document could be considered the initiator of a new era,*

making available sex-disaggregated data on human resources in the European Research Area (ERA). This meant that all the countries involved in this activity were able to monitor the indicators, thus observing the changes occurring in the gender dynamics of the ERA. This resource is utilised widely by the SET community and researchers in general and makes comparative monitoring and evaluation possible. So, for instance, *Figures 2006* was able to indicate a slight improvement in the participation of women in SET and by the 2009 report, the proportion had progressed even further and especially so for women in senior and leadership positions.

ENWISE published *Waste of Talents; turning private struggles into a public issue* in 2004 providing recommendations on (1) how to raise awareness of the need for gender equality in science in the ENWISE countries and (2) how to improve the role of their female scientists in the ERA. The EC also presented *Excellence and Innovation – Gender Equality in Science* to the European Council, updating them on women and science policy issues. This working paper identified progress being made at national levels such as the establishment of gender equality policies in various Member States and the set up of national steering committees and units as well as national resource and coordination centres dedicated to women in science issues.

With the European Council adopting a proposal made by the EC for a 25% target of women employed on the decisionmaking level in public research in 2004, the focus seemed to shift somewhat to mainstreaming gender in EU research policy but particularly with an emphasis on the lack of female representation in leadership. This was further enhanced by the establishment of the *Women in Decision Making (WIRDEM) Expert Group* commissioned in 2006 to analyse research decisionmaking in Europe from a gender perspective and to identify good practice in the promotion of women to top decisionmaking positions in research. WIRDEM then also published *Mapping the Maze: Getting more women to the top in research (2008)* calling for changes in the EU research systems to appropriately redress the under-representation of female scientists in top decision-making positions.

The debate around the male-dominated nature of science and the tension of reconciling a professional and private life started to receive some attention with the development of the *European Charter for Researchers and Code of Conduct for the Recruitment of Researchers* (2006). These provided a set of principles and requirements that specified the roles, responsibilities and entitlements of researchers, employers and funders within the sciences.

In 2007, the issue of differences in recognition and reward started to enter the policy debate more strongly with the publication of the *Study on the remuneration of researchers in the public and private commercial sector* highlighting the gender pay gap in SET. The report provides data on the remuneration of researchers in the public and private sector and career recognition of researchers in comparison to other professions, indicating that researchers are not as well paid as many other professions and especially so for women. This debate was taken one step further with the publication of *Gender challenge in research funding* (2009) indicating that decisionmaking and gate-keeping of

research funding was still predominately steered by men and required serious redress. The positive finding from the report was that the gender imbalance in terms of success rates in research funding was much smaller than initially anticipated, although with a few exceptions.

2007 and 2008 mark a period of stocktaking for the EC. Firstly the *Mid-Term Assessment of Science and Society Activities* revealed that most projects were focused on awareness-raising around the participation of women in SET and the establishment of structures (databases, centres, platforms) that could serve as a base for long-term strategies aimed at increasing the participation of women, in particular female scientists. However, the report also revealed the need to specifically target the general public, research community and private sectors. It was identified that increased funding could increase the effectiveness and longevity of initiatives and that the potential impact was fragmented and not covering the complete system. In conclusion, the report noted that gender mainstreaming was often captured in legislative and policy documents but not necessarily implemented. Secondly, with *Benchmarking policy measures for gender equality in science*, published as an update of the 2002 Helsinki Group report on national policies. Positive results from this report included 38 countries indicating some form of equality legislation, 35 countries establishing national gender equality agencies, 26 countries having mainstreaming plans in place, and 35 countries being able to provide sex-disaggregated statistics.

The EC, after this period of stocktaking, took a new policy direction shifting the focus of activities towards the research institutions and organisations where women in science work rather than on the women themselves. As a result *GAP* was also discontinued in FP7 and replaced by the 'toolkit' for gender mainstreaming, the main objective being to build gender capacity within the research community to ensure the practical application of gender mainstreaming. This was supported by the development of the *Human Resources Strategy for Researchers* (2009) designed to implement the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers. The toolkit addressed issues such as sustainable career prospects at all career stages, transparency in selection and evaluation procedures, promoting healthy work-life balance and addressing mobility as reality of a research career.

To summarise, the following extracts from the EC's *Stocktaking 10 years of 'Women in Science' policy (1999-2009)* illustrate how the EC's policy focus has shifted over the past ten years setting a path for others to follow:

Ten years ago, the rationale taken on board by the European Commission was evident: "too few women in science, slow-moving careers and a strong under-representation of women at the top level in research decision-making". The underlying argument – "No data, no problem, no policy" – therefore became the motivation to initiate and guide our work: statistics gathering was carried out across Europe, problems were highlighted, possible solutions identified and gender research policies designed and implemented by individual Member

States. This “stocktaking” illustrates how the Commission provided the impulse, and acted as a catalyst and multiplier, shaping and coordinating the efforts. The “stocktaking” report also describes and assesses the large number of projects funded by the 6th and 7th European Framework Programmes for Research and Technological Development, their contribution to our two big “steps” – the first aimed at encouraging, preparing and adapting women to the existing research system, and the second aimed at adapting the research system to women’s needs (structural change). An attentive reader may note the progressively less frequent use, throughout the text, of the term “Women and Science” in favour of a more frequent reference to “Gender and Science”. This change actually reflects an evolution resulting from knowledge that has been acquired along the way. In fact, after the first years of activities, it became clear that our goal was no longer just to attain equality in science but rather to also ensure quality in science. We may then say that a “fair science in a fair society” is our journey’s final destination. This implies an equal participation of all available potential, and all points of view, in the development of a “science and technology” that is aimed at responding to the needs of all human beings.

(EC, 2010b: 7)

Figure 4.1: EC Policy development (1993-2010)

Influential Organisations/Reports		Milestone Moments
Women in scientific and technological research in the European Community workshop	1993	Determining the situation and challenges of women in science Collection and comparison of sex-disaggregated data
Women in Science Conference	1998	Mainstreaming of gender into all EC policies
ETAN Working Group & Report		
Women and Science – Mobilising women to enrich European research report	1999	Stimulate discussion and sharing of experiences in the field among Member States
Establishment of national steering committees on women and science	2000	European Council provides resources for further research into understanding of gender and science
Women and Science: Making change happen Conference	2001	Primary focus now on: ↓
Gender and Research Conference		
Set-up of Helsinki Group on Women and Science		1. Creation of European platform of women scientists
Set-up of Women and Science Unit		2. Production of a set of gender indicators
Set-up of STRATA-ETAN Expert Group		3. Analysis of the role and place of women in research carried out in the private sector
Set-up of ENWISE group		4. Analysis of the situation facing women scientists in Central and Eastern Europe and the Baltic States
National Policies on women and science in Europe	2002	Shift towards the effective recruiting, promoting and retaining of more women in science careers
Women in industrial research – A wake-up call for European industry	2003	Reviewing the options for the private sector to increase the participation of women in their sector
She Figures 2003		First official figures on the participation of women in science at tertiary and employment level – M&E focus
Waste of Talents – Turning private struggles into a public issue	2004	Awareness raising of need for gender equality in science in ENWISE countries

Excellence and Innovation – Gender Equality in Science	2005	Progress highlighted at national level such as gender equity policies, national steering committees and units, national resource and coordination centres
European Charter for Researchers and Code of Conduct for the Recruitment of Researchers	2006	First debate around male-dominated nature of science and the tension of reconciling professional and private life
Study on the remuneration of researchers in the public and private commercial sector	2007	First debate around the issue of differences in recognition and reward – highlighting the gender pay gap in SET
Mid-term Assessment of Science and Society Activities	2007	Period of stocktaking that found that awareness raising efforts and establishment of structures (databases, centres, platforms) very successful to date. Challenges included mainstreaming implementation; sustainability of projects; and fragmented nature of interventions
Benchmarking policy measures for gender equality in science	2008	
Mapping the Maze: Getting more women to the top in research	2009	Highlights the lack of female representation in SET leadership
Gender challenge in research funding	2009	Highlights the fact that decision-making and gate-keeping of research funding is still predominantly steered by males
Fixing the administration approach	2009	Focus of activities to be shifted toward the research institutions that employ female researchers, rather than on the women themselves
Human Resources Strategy for Researchers	2010	Main objective to build gender capacity within the research community to ensure practical gender mainstreaming is applied
Stocktaking 10 years of 'Women in Science' policy (1999-2009)	2010	Shift from 'women and science' to 'gender and science' – goal no longer just equality in science but rather to also ensure quality in science

National level

The UK is a prime example of how the promotion of women in SET has been driven at national level. This process started with the publication of the Government White Paper (*Realising Our Potential*, 1993) highlighting the importance of SET for the UK's growth and development and the under-representation of women in this process. This then sparked the release of the *Rising Tide* report (1993) which was the first evaluation of the situation of women in SET in the UK and as a result, the Promoting SET for Women Unit (PWSET) was established in 1994 in the Office of S&T. The role of this unit was to improve the recruitment, retention and progression of women throughout SET education and employment and to increase their participation in shaping SET policy. This unit contributed to the production of the Science and Innovation White Paper (2000) entitled *Excellence and Opportunity: a science and innovation policy for the 21st century*, which presented a policy for improving the opportunities for women in SET. This was shortly followed by the *SET FAIR* report (2002) by Baroness Greenfield. Baroness Greenfield was requested to comment on possible causes for the perceived under-representation of women in SET and to provide an intervention strategy. The report highlighted the need to: (1) *reduce fragmentation of efforts and enable all stakeholders to play an active and effective part in change*, (2) *help employers to deliver a change in culture, supporting individual women scientists, engineers, and the organizations who help to manage the skills and workforce for each*, and (3) *stimulate organizational policy implementation to create an inclusive, modern working environment* (Peters et al, 2002:9).

The first major stumbling block identified was the need for a national vehicle to drive this process as the study identified almost 70 initiatives in the UK alone dedicated to increasing and facilitating the participation of women in SET. However, they all functioned independently from each other, did not measure their progress and had limited scope and funding. From this, the first proposal was made for a Working Science Centre that would later be realised in the Strategy for women in SET (2003). The other major issue identified from the report was the retention and return of women in SET with proposals for specific returner funding schemes, job-sharing incentive programmes and profiling schemes for senior women in SET offered as counter measures - many of these ideas were then also absorbed into the *Strategy for women in SET*. At policy level recommendations were made to enforce certain requirements in the reporting from national and educational institutions on measures such as: *the number of women on all management and strategy-making bodies and a statement of intent and evidence of action to ensure that it happens, code of good practices signed and adopted by all managers and employees, level of part-time working, packages of flexibility measures available to employees, evidence of training in diversity, childcare policies and schemes, staff satisfaction surveys, and reporting on the number of women applying and resigning from institutions* (Peters et al, 2002:15). The report concluded with the recommendation of establishing a SET advisory panel to consult on key scientific issues and to help steer the implementation process.

The main driving force to increase and facilitate the participation of women in SET in the UK was the *Strategy for women in SET* from the Department of Trade and Industry (DTI), the Office of Science and Technology (2003). This strategy was a response from the UK government to the SET FAIR report. The strategy primarily aimed at addressing the particular issues identified in the SET FAIR report and, in particular, government's ability to address these at a national level. The role of government was seen as crucial, as indicated by their own definition of their involvement in SET: *Government has a major influence on the world of work as a major employer of scientists and engineers, and with other employers as legislator and through supporting change; Government funds primary, secondary, further, and higher education, as well as life-long learning; and Government is a significant investor in research and researchers* (DTI, 2003:2). The strategy stresses the importance of linking to the UK's policy framework for achieving gender equality (Gender Equality Action Plan) and also the involvement of the advocates, the education sector and employers in the identification, establishment and implementation of best practices. Interestingly the focus of the report is not just on women in SET but even more on the dominant male scientists who are committed to building an equal future in the world of science. As recommended by the report, an independent implementation group was established to oversee the implementation of the strategy in collaboration with the PSETW. One of the main initiatives described in the strategy included the setting-up of a resource centre for women in SET that would (1) offer support and training to SET employers and professional bodies; (2) raise the profile of women in SET; (3) set-up a women's expert database; (4) produce good practice guides and develop means to recognise good SET employers; (5) raise funds to support innovative pilot projects for mentoring and networking; and (6) raise and distribute funds specifically for 'returners'. The United Kingdom Resource Centre (UKRC) was subsequently established in 2004.

The UKRC, funded by the UK Department for Business Innovation and Skills, is currently the primary resource, training and advocacy centre for women in SET, and is involved in all issues pertaining to the under-representation of women in this sector. The Centre draws on the experience of women working in science in the private, public and academic sectors. Some key activities of the UKRC include the recognition of good SET employers, sharing of good practices, information sharing and dissemination, a database and key statistics of women working in science, funding for pilot projects and returner schemes, mentoring and training. Another tangible resource that emerged from the strategy is the UK Database of Expert Women in SET, which houses the contact and background information of women that are experts in the field of SET. Forthcoming as a recommendation from SET FAIR the Higher Education Funding Council for England (HEFCE) allocates extra funding to institutions that provide detailed plans of the recruitment and development of female staff and measure to ensure that equal opportunities, including equal pay for work of equal value, are central to their staff management.

The DTI has been incorporated into the Department for Business Innovation Skills (BIS) and all activities related to women in SET are now housed and coordinated by the UKRC. They are supported by the Expert Group for Women in STEM made up of independent members who come together three times a year to monitor, review and advise on progress made in the implementation of the Strategy for women in SET.

Institutional level

In Europe, at institutional level, tertiary institutions are encouraged to produce gender equity plans and, in countries such as the Netherlands and Denmark, are even ranked according to the number and percentage of women in senior positions. A large proportion of countries also have special funding programmes for the promotion of women in science bursaries for PhD studies, fast track programmes for senior positions, returner schemes, funding of gender projects and conferences and grants (Commission of the European Communities, 2005). In Norway, legislation requires all institutions (private and public) to have 40% female representation on their governing boards and that the selection boards are representative of both genders. Ireland has a target of 40% female representation on all public boards. In 2002, Austria adopted a new legal framework for universities with a strong focus on equality. All universities in Austria are required to develop an equality plan and must establish an equality committee (EC, 2009c). In Germany, the appointment of equal opportunity officers is mandatory for all universities (EC, 2008). These officers are tasked with representing the interests of female staff and students and with monitoring the transparency and fairness of all selection and appointment procedures.

An example of where national policy has had an effect at institutional level is that of the Swiss federal programme for gender equality in universities. In Switzerland, all decisions regarding education at national level fall under the authority of the cantons (provinces). Switzerland has 12 universities, of

which ten fall under the authority of the various cantons and only two, the Federal Institutes of Technology, are funded and governed by the national government. This placed the national government in a position where the majority of universities could only be motivated to bring their policies in line with their national vision by making use of incentives. When serious reform in Swedish Higher Education became a priority in the 1990s this programme of funding by national government to canton universities based on innovation and cooperation was put in place. The programme was seen as an ideal tool to enlarge the reach of the national government's programme for gender equality. The first programme period was 2000-2003 and the aim was *to double the percentage of female full and associate professors at Swiss universities and to increase the proportion of women at all stages of an academic career*. Although at the time it seemed unreachable, this target was indeed achieved during the second programme period (2004-2007) resulting in a new target for the 2008-2011 period, which was to aim for 25% female representation among all professors by 2012. The programme is managed by the Swiss Universities Rectors Conference and composes three modules: (1) Incentives for the nomination of female professors; (2) Mentoring programmes for the promotion of female junior researchers; and (3) Support for Child Care, Work-Life Balance and Dual Careers. Module 1 is used to reward universities who employ female professors in tenured positions. At the end of the year, the budget for module one is then distributed among the universities based on the number of newly appointed female professors. For module 2, universities are encouraged to submit project plans for mentoring on a two-yearly basis. If approved, the university contributes 50% of the project and national government finances the remaining share. Universities can reapply for the same project on a continual basis to ensure the longevity, but with each round of funding the portion the university needs to subsidise increases, for example, the second round of funding would usually result in 30% state funding and 70% institutional funding. For module 3, the first two phases of funding were dedicated to the establishment of childcare facilities within higher education institutions. The current round of funding is dedicated to Dual Career Couples (DCC), with a portion of the funding being rewarded to institutions that are starting up their own DCC policies and initiative and the other part of the funding is placed into a pool earmarked for the support of specific DCC couples. Examples of this type of funding include providing a start-up amount for the newly appointed academic staff member with additional funding to relocate and attract the staff member's partner into the same institution. Once again the state funds half of the DCC's expenses while the university is responsible for matching the expenses. In a recent evaluation of the programme, the most noteworthy results included the increase in female professors from 7% in 1998 to 14% in 2006; the establishment of offices for gender equality at all universities in Switzerland, which has enhanced the debate and sharing of good practices in gender equality on regional and national level; and the establishment of mentoring programmes at all Swiss universities as well as childcare facilities at every single university in Switzerland.

http://www.cdp.udl.cat/home/images/pdfs/presentacions_ji/pre_helene_fuger2.pdf

The Total E-Quality award is another example of an effective measure used to encourage real change in gender equality policy and practice at institutional/organisational level (EC, 2003c). The scheme was launched in 1996 by a group of German employees and trade unions with the support of the

German government and the EC. The award rewards organisations/companies that not only put policies but also practices in place to ensure equal opportunities and promotion for female employees. Application is voluntary and based on a self-assessment checklist that is then assessed by an independent jury. Award winners receive a certificate but more importantly the right to use the award's logo for marketing and recruitment purposes. Winners have to reapply every three years. The award was initially used for the business sector but has subsequently been rolled out to universities and other scientific institutions at a national and international level.

It is not coincidental that such a huge segment of this chapter is dedicated to the discussion of policy implementation as a mode of intervention in increasing and facilitating the participation of women in SET. It becomes clear from the above that policy is indeed a crucial and often first step in addressing equality in SET participation. The EC policy implementation around the issue of women and science demonstrates how effective policies can influence an entire region if all parties are committed, focused, working within a strategic structure and willing and able to share experiences and best practices. The EC example also illustrates the importance of putting systems in place to effectively monitor progress, and to review and adjust strategies and goals along the way. The initial focus was on determining the reality of women studying and working in SET, then ensuring their access (through mainstreaming and other policies), and from there the focus has shifted to issues of facilitating participation. This facilitation is steadily being enhanced by researching and designing policies and programmes to address issues of work-life balance, equal reward and recognition and working towards placing more women in SET leadership positions. Within the region countries such as the UK have also done well in taking these policies seriously and have made them their own. Firstly by implementing a national strategy which eventually resulted in various initiatives, first run by government, and now self-sustaining and housed under one umbrella body; once again proving that if gender equality is a national priority, good policies result in good practice. Also within the region, countries such as Sweden, the Netherlands, Denmark, Austria and Germany have filtered these national gender policies down to institutional level where they are rewarded externally by government but also internally for applying good policies and practices that potentially increase and facilitate the participation of women in SET.

4.2.2 Gender mainstreaming

The EC defines "gender mainstreaming" as 'openly taking into account and systematically integrating the respective situations of women and men in policy development, with a view to promoting gender equality' (EC, 2003b). Haataja et al (2006) stresses that for mainstreaming to have a significant impact both the application of vertical and horizontal mainstreaming is required. Vertical mainstreaming refers to the transfer of experiences and best practices on institutional/organisational, political/legislative and administrative level, while horizontal mainstreaming refers to the distribution of these best practices between organisations/institutions. Tools for gender mainstreaming include sex-disaggregated statistics, equal opportunity measures, monitoring and evaluation and researching gender distribution in placement and decision-making as well as policy and training measures that

assist in establishing an understanding and culture of gender equality. Practically this would take the form of presenting written and verbal arguments to policy- and decisionmakers at every possible gathering such as seminars, conferences, political discussions at a local, national and international level and engaging the media to help paint the picture and apply pressure. Once the idea has been successfully communicated and commitments have been made, measures of a reward and legislative nature are put in place to monitor the implementation and to measure the impact, while providing ongoing training and support to practitioners.

Gender mainstreaming has been a popular and effective mechanism applied by the Helsinki Group. In an effort to support mainstreaming, countries have set-up statistical databases containing sex-disaggregated data that conform to the Frascati Manual and Eurostat conventions. The group of statistical correspondents, a subgroup of the Helsinki Group, has strongly influenced benchmarking and statistical policies by producing publications such as the *She Figures*, containing the broadest collection of European data on women and science. Their influence is also visible in the fact that sex-disaggregated data has been integrated into the data Eurostat collects, making it possible to produce a variety of gender-sensitive indicators used to measure the success rates of males and females in achieving senior positions and their levels of access to research funding.

Other gender mainstreaming measures that have been put in place relate to gender studies, human resource practices focused on transparency in recruitment and promotion and work/life balance. Norway is one of the leading countries in terms of research and implementation of gender mainstreaming in science (EC, 2009c). In 2004, the Norwegian Research and Higher Education Minister established an Independent Committee on Mainstreaming Women in Science with a focus on mainstreaming efforts in higher education and research institutes. The Committee has established a website with information on resources for awareness raising and mainstreaming of gender equality in science that is accessible on a national and international level.

At the institutional level organisations such as UNESCO actively promote and monitor the mainstreaming of gender issues throughout the organisations programmes. The UNESCO's Section for Women and Gender Equality has set up a Gender Mainstreaming Resource Centre that collects and disseminates data from field offices and applies the data in assisting other policy-makers and staff working outside the organisation to meet their gender mainstreaming targets.

A relatively new concept in mainstreaming is the idea of *gender budgeting*. The EC (2010b) describes gender budgeting as an integral part of the gender mainstreaming strategy and defines it as *the application of gender mainstreaming in the budgetary process – this entails a gender-based assessment of budgets, incorporating a gender perspective at all levels of the budgetary process and restructuring revenues and expenditures in order to promote gender equality* (EC, 2010b:122). Gender budgeting does not imply separate budget lines for men and women or the restricted view of only taking into account those budget lines that have a definite gender dimension or aim at increasing

expenditure on men or women. It is rather proposed that all steps of the budgeting process be taken into account and the gender dimension be considered in planning, adoption, implementation, auditing and evaluation of budgets on national and institutional level – in other words – *the integration of gender equality objectives into governance and control and to link policy objectives of gender equality with the resource allocation* (EC, 2010b:124). Norway has taken the lead in implementing gender budgeting as a mainstreaming tool. The Norwegian ministries are legally required to conduct a gender-budgeting exercise. The University of Oslo has adopted this policy and has subsequently set up a working group to review the distribution of funds between male and female staff across various faculties. The task of the working group is to *evaluate, from a equal opportunities point of view, the plans and budgets of the university, with the aim of initiating corrective action where necessary to ensure a fair and effective use of resources* (EC, 2010b:124).

4.2.3 Role of advocacy and interest groups

It becomes increasingly evident that both policies and mainstreaming measures are in many cases the first and most effective tools in increasing the participation of women in SET, but that these measures have little effect if not followed through by additional action. There are various instances where progressive strategies and legislation are in place but the measures to steer the process are non-existent (EC, 2009c). Such examples include Estonia that has an R&D Innovation Strategy 2007-2013 mentioning gender equality as a preferred condition but with no targets or actions linked to the objective. France also has a specific body within the Research Ministry to monitor gender issues yet gender equality is not seen as a priority and therefore this monitoring serves no real purpose in bringing about reform. Bulgaria even established a National Steering Committee on Women and Science but has had no impact as no budget exists for them to take any action. When government and decisionmakers are not willing or able to lead the way there seems to be a natural coming-together of various interest groups that drive the process through advocacy and lobbying activities – either to change the existing situation or to implement the ‘ideal’.

Networks of women scientists have been identified as significant role-players in the research policy process, influential in the empowerment of women scientists, in the attempt to increase the gender distribution of scientists in top positions, and in making the voice of women scientists audible in the policy debate on a national, regional and international level (EC, 2008). The European Platform of Women Scientists (EPWS) was one of the initiatives that resulted from FP6 seed funding in 2005. The Platform is an international non-profit organisation governed by a range of established female scientists with 180 members from 41 countries representing more than 12 000 women scientists. EPWS contributes strategically to European research policy and links women scientists from all disciplines to policymakers by supporting a variety of initiatives taken at national level to increase the amount and level of female participation in the ERA (<http://www.epws.org/index.php>).

As mentioned previously the EC established a group of independent scientists, known as the Women in Research Decision-Making (WIRDEM) Expert Group, to first examine women in decision-making

positions within European research, and then, armed with the data, to start advocating for reform (EC, 2008). The group comprises established scientists from different disciplines representing higher education institutions, research bodies and funding agencies from 15 different countries. This initiative is unique as it is one of the few groupings that specifically targets the issue of women towards the end of the pipeline and is focused on determining not only what is not working in terms of the promotion of women but also to identify best practice examples for duplication purposes.

An example of such bodies active in developing countries is the Organization for Women in Science for the Developing World (OWSD), previously known as TWOWS. OWSD is an international grouping of prominent female scientists from both developing and developed countries that share the goal of promoting female representation in SET development and leadership. The organisation's activities include post-graduate training fellowships, prizes and awards for outstanding female scientists, and publications and meetings used for awareness raising, advocacy and lobbying opportunities.

Although a journal might not typically be classified as an advocacy and lobbying tool, the *International Journal of Gender Science and Technology* (GST) is a journal that indirectly has been giving a voice to various stakeholders concerned with SET and gender issues. GST is an open access, peer-reviewed journal that welcomes contributions from practitioners, researchers and policymakers concerned with gender issues in and of science and technology, including engineering, construction and the built environment. Research and articles that are published are not just focused on academics, but also include employers and educators in these sectors and they welcome input from other interdisciplinary fields. GST's aim is to help foster and provide a focus for constructive debate and interchange of ideas between key players and experts in this field - promoting the sharing of knowledge and new understandings. (<http://genderandset.open.ac.uk/index.php/genderandset/index>)

4.2.4 Provision of training and support

The literature indicates that the process of recruiting, advancing and retaining women in SET already begins with the identification of young students with SET potential at tertiary level, who receive support from industry in the form of financial assistance, induction and mentoring once they start to enter the field (Moletsane, 2008). These young women are then exposed to continuous in-service training aimed at easing them into the organisation's culture and to advance their chances for moving along the 'pipeline'. The focus should however not only be on the new female recruits, but also on existing staff who should receive training in gender sensitivity and gender equity practices.

Mentoring is popularly used for training and support in the SET field. Electronic mentoring, also termed telementoring, cybermentoring or virtual mentoring, is a relatively new but very prevalent support mechanism for women studying, entering or working in SET (Mueller, 2004). Within this context mentoring refers to a relationship where an experienced scientist (male or female) known as the mentor, commits to assisting a younger or less experienced student or scientist, the mentee, in advancing her academic, professional and personal development via the use of ICT. Obviously the

greatest advantage of this form of support is that it crosses all geographical and time restrictions usually associated with people trying to 'connect or meet' in a face-to-face context. These 'connections' usually take place through a combination of interactive websites, e-mail, electronic newsletters and online discussion groups. Other advantages associated with electronic mentoring include senior scientists being more willing to mentor as the flexibility of connecting and responding to mentees can be planned around their schedule meaning less disruption to their work schedule; thus also giving them time to reflect on an answer and therefore most probably be more sincere and thorough in their response.

Mueller (2004) also believes that this form of mentoring removes some of the social and hierarchical barriers that often occur when an inexperienced student or worker interacts with a person of seemingly higher status. From a financial point of view it is also much less costly to set up, roll-out, maintain and even expand when compared to the costs of face-to-face mentoring. On the other hand, the reality exists that this form of mentoring only becomes an option for those that have access to adequate ICT resources and that miscommunication can creep in due to the lack of interpersonal contact and possible breaks in communication when computer glitches occur. In surveying students using electronic mentoring in engineering education Mueller however found predominantly positive feedback with some students even stating that if it was not for the timely and wise advice of their mentors at critical times in their studies they would probably have abandoned their pursuit of an engineering career. Furthermore, students felt that mentors placed outside of their immediate academic context also gave them a more realistic picture of what to expect when working in industry. The mentors also reported the mentoring relationship as a positive one, often recommitting themselves to their field when forced to reflect and retrace the steps they had to follow to 'climb the career ladder'.

The more 'traditional' form of mentoring usually entails regular face-to-face meetings/interactions between mentors and mentees. Mentors are well-established female scientists mentoring young girls towards an interest in pursuing a career in SET; students enrolled in SET fields or young women just entering the field. One such example is WomenIT that use various forms of mentoring to promote a career in SET among young girls and women (Haataja et al, 2006). The peer-mentoring programme of WomenIT has technology undergraduate students mentoring high-school students. The programme is usually launched with a one-day seminar, with meetings during holidays also substituted with visits to organisations and higher education institutions where senior women share their personal and professional experiences in 'moving along the pipeline' in their chosen field and managing a work-life balance.

Along with mentoring, role models are acknowledged as important tools for attracting and retaining young girls and women in SET studies and careers especially in countering gender stereotypes (EC, 2010b). Young girls are exposed to either female students in SET or established female scientists thus exposing them to a wider range of subject and course selection. Opportunities are also created

for female SET students to interact with senior women working in SET to encourage them in their studies and ease them onto their career paths. Role models are most often identified, and interactions arranged, via professional associations and women in SET networks. In general the feedback regarding the exposure of young girls and women to successful female role models in SET has been positive. However, planning is crucial as serving as a role model should also have a positive effect for the 'role model' and not place a time constraint on her career advancement and unnecessary pressure to 'perform'.

Although almost all persons working in SET would confirm the value of both mentoring and role model schemes in increasing the participation in women in SET, hardly any formal evaluation has been undertaken to determine the long-term impact of such schemes. To address this need the EC, in 2006, conducted the most thorough study to date entitled *Science mentoring and science ambassador's scheme*. The study aimed to *identify and disseminate best practice in science mentoring and science ambassador schemes across Europe*. The study found that only a few schemes were sustainable in terms of funding and longevity of activities. The majority of schemes had limited funding and resources and were highly dependent on volunteers from within the science community. The main recommendation coming from the study was the formation of a *European level action plan for science mentoring and ambassador activities*, which then gave rise to the establishment of the European Network of Academic Mentoring Programmes for Women Scientists (Eument-net) (EC, 2010b). Eument-net is an international network of mentoring programmes promoting gender equality in academia and research. The association started as a project funded by the 6th European Framework programme, and includes partners from Switzerland, Germany, Austria and Bulgaria. Eument-net aims to highlight the role mentoring can play in promoting gender equality, to set standards for mentoring in academia and research, and to share best practices in mentoring across countries and institutions (EC, 2008).

Other forms of support are also found within and across institutions and organisations, with these bodies making provision for in-house services and training opportunities for achieving work-life balance and skills development and progressing down a SET career path. Besides just providing in-house or emotional support a very practical cross-company example of support is housed within Partnerjob.com. Partnerjob.com is a non-profit association set-up in 2000 by Air Liquide, Areva, Danone, Hewlett-Packard, Ondeo, Rhodia, Schlumberger and Thales with the aim of assisting migrating spouses. The site hosts a list of posts available in member companies, so that when one spouse needs to relocate the 'trailing spouse' can potentially apply for such positions or post their particulars on the site for recruiters to view. The site also offers an online forum where users can share experiences and advice (EU, 2003c).

4.2.5 The private sector

As mentioned previously the initiatives summary database does not do justice to initiatives housed within the private sector. The majority of reviewed initiatives are housed and driven within the

government and higher education sectors, as they are most accessible online and collectively are more active at national and institutional level. This does however not mean that nothing is being done in the private sector to facilitate the participation of women in SET. The private sector/industry is problematic to cover as most company policies and programmes focused on gender equality are published internally and are therefore not in the public domain. This section therefore concludes with a brief summary of initiatives housed within the private R&D sector as presented by an EC study (EC, 2003b) in an effort to provide some indication of initiatives being taken within the private sector.

The European Commission (2003c) published a brochure highlighting a series of case studies on initiatives European R&D companies have taken in addressing the participation of women in the sector. The case studies are based on feedback from a questionnaire sent out by the EC and the European Industrial Research Management Association (EIRMA) to companies, interviews with women in various stages of their careers and HR practitioners within these companies. A summary of the companies highlighted in the brochure follows in *Table 4.2*.

Table 4.2: European R&D company initiatives addressing the participation of women in SET

AstraZeneca	
Industry	Pharmaceutical
Portion of female researchers	50%
Portion of female managers	29%
Description	<ul style="list-style-type: none"> • Senior management team members are assigned responsibility for developing a diversity improvement plan for their specific section and are branded as a unique project with own logo etc. In this way the responsibility lies not with HR but with each line manager. Progress is measured annually against the set plan. • Diversity awareness is also communicated via poster sessions, website with questions and answers and training material, and interaction theatre productions.
BioAlliance Pharma	
Industry	Pharmaceutical
Portion of female researchers	66%
Portion of female managers	CEO, 7 project managers
Description	<ul style="list-style-type: none"> • The founder and CEO is female, as well as more than half of all researchers. • Provision is made for flexi-time and childcare arrangements.
Biotechnol	
Industry	Biotechnology
Portion of female researchers	70%
Portion of female managers	3 out of 7 research managers
Description	<ul style="list-style-type: none"> • More than two-thirds of researchers are women. • Provision is made for flexi-time and childcare arrangements.
DSM	
Industry	Life science and performance materials
Portion of female researchers	20%
Portion of female managers	1 R&D director (0.5%) 20 resource managers (20%) 50 project managers (10%)
Description	<ul style="list-style-type: none"> • Company's mission statement clearly states opposition to any discrimination on any grounds, including gender. • Clear targets are set for gender equity in management positions. • Written-up equal pay policy. • Awareness-raising programmes for management staff.

	<ul style="list-style-type: none"> •Mentoring and coaching programmes for women. •Provision for flexi-time, teleworking arrangements.
Ford Motor Company	
Industry	Car manufacturing
Portion of female researchers	16%
Portion of female managers	5%
Description	<ul style="list-style-type: none"> •Diversity awareness raising and monitoring programmes at management level. •Zero tolerance policy towards harassment and discrimination. •Provision for flexi-time, job-sharing, teleworking arrangements, childcare facilities. •School programmes to encourage high school girls to pursue careers in engineering. •Scholarship schemes assisting female university students.
IBM	
Industry	Information technology
Portion of female researchers	14.7% (Europe only)
Portion of female managers	Not available
Description	<ul style="list-style-type: none"> •Offer fully funded EXITE (Exploring Interest in Technology and Engineering) hands-on-technology camps designed to boost interest in maths and science among school girls by exposing them to leading IBM women technologists while interacting in fun, hands-on activities. •Online mentoring programme matching IBM employees with students and teachers.
Microsoft	
Industry	Information Technology
Portion of female researchers	8% (UK only)
Portion of female managers	Not available
Description	<ul style="list-style-type: none"> •DigiGirلز high-tech camps for girls designed to boost interest in maths and science among school girls. •Annual Take our Daughter to Work Day. •Provision for flexi-time. •Onsite childcare facilities.
Outokumpu Research Oy	
Industry	Metallurgy
Portion of female researchers	24%
Portion of female managers	28%
Description	Within the Outokumpu group a number of women engineers took the initiative to set-up their own network for women working within the corporation, now known as NICE. They receive funding and support from management and activities include meetings, excursions, and social events. The focus is on extending their knowledge of their local industries and sector, and also on offering support to each other on how to work within a traditionally male environment.
Norsk Hydro ASA	
Industry	Oil and energy, fertilisers, light metals
Portion of female researchers	Not available
Portion of female managers	Not available
Description	<ul style="list-style-type: none"> •Already launched their first equal opportunities action plan in 1984. •Committed to extensive research into gender and diversity issues within the company. •Supported the Confederation of Norwegian Business and Industry (CNBI) 'Project Discovery', a mentoring scheme linking men and women from public and private sector. Aim of the project was to increase the profile of highly-qualified women and their placement in senior management positions. •Provision for flexi-time (also for male staff – encourage men to take parental leave and reduce working hours in an effort to create stronger family ties and as a result happier employees).
Schering AG	
Industry	Pharmaceutical
Portion of female researchers	29% (Germany only)

Portion of female managers	17% (Germany only)
Description	<ul style="list-style-type: none"> • Equal opportunity policy is long established. • A Policy Unit for Women's Affairs set-up in 1990: Initially focused on the advancement of female workers within the company, but focus has now shifted to assisting male and female staff on (1) working together as different sexes, and (2) achieving a healthy work-life balance. • Internal mentoring programme for female managers. • In-house daycare centre since 1973. Provision for flexi-time (been running for more than 30 years).
Schlumberger	
Industry	Oilfield and information services
Portion of female researchers	19%
Portion of female managers	9%
Description	<ul style="list-style-type: none"> • Culture of 'access to a larger and more diverse pool of talent gives one a key competitive edge'. • Staff assessments include relevant information on employee's personal lives, for example the career needs of their spouses/partners and their parental responsibilities.
Siemens AG	
Industry	Energy and communications
Portion of female researchers	14%
Portion of female managers	9%
Description	<ul style="list-style-type: none"> • Recruiting initiatives include Technology Adventure Camps for young girls and Yolante (Young Ladies' Network of Technology) programme – a coaching programme for female students in technology fields. • Retention strategies include provision for part-time work, flexi-time, working from home, and an intranet platform to assist parent in locating childcare support.
Telenor ASA	
Industry	Telecommunications
Portion of female researchers	22%
Portion of female managers	10%
Description	<ul style="list-style-type: none"> • Strict enforcement of Norwegian legislation on gender equality such as the Gender Equality Act, and also the National Insurance Act that makes provision for one year off maternity leave for Norwegian mothers. • Maternity pay that amounts to the total level of the employee's salary.

Although this study is somewhat dated the assumption can be made that some of these initiatives have been extended and duplicated across industry and a follow-up study focused particularly at this sector would be of great value to the field of women in SET. The brochure highlights the following measures perceived as being critical in creating a '*stimulating, creative and gender-aware*' company ethos:

- A commitment from the top to gender equality, diversity policies and dignity at work – integrated into strategy, reporting mechanisms and performance review systems.
- Monitoring, evaluation, auditing, statistics, surveys, staff consultation, and analysis of policies.
- An attractive work environment, which encourages innovation, offers career development opportunities, values output rather than presence and brain hours rather than body hours.
- A high degree of transparency and two-way communications, merit-based open recruitment, promotion and staff review procedures.

- Flexible work schedules, opportunities for distance working if appropriate, alternative to excessive travelling at certain times in the life cycle, through use of new technologies or reassessment of essential job features.
- Sound work/life balance policies, maternity and paternity leave, childcare facilities or subsidised care, emergency leave to care for sick dependents.
- Partnerships arrangements to encourage young women into science with local schools, colleges and universities, offering internships, fellowships, role models, mentors, speakers and work experience.
- Modern role models, networking and mentoring schemes.

Table 4.3 indicates how the various case studies have scored in terms of these measures.

Table 4.3: Measurement of European R&D companies in creating gender-aware working environments

	AST	BIOA	BIOT	DSM	FORD	IBM	MICRO	OUTO	SHER	SCHL	SIEM	TELE
Regular monitoring												
Objectives for management												
Awareness-raising measure												
Mentoring programmes												
Training for female high potentials												
Women's network												
Diversity groups												
Childcare												
Family services												
Flexible time arrangements												
Teleworking												
Recruitment efforts												

Career planning												
Flexible career arrangements												
Others					*						**	

*Job-sharing, personal development plans, part-time working, skip level meetings, internal diversity awards, senior management sponsorship, diversity training.

** Active engagement in diverse programmes and initiatives to encourage young women to pursue studies in technical/engineering/natural sciences fields.

AST	AstraZeneca
BIOA	BioAlliance Pharma
BIOT	Biotechnol
DSM	DSM
FORD	Ford Motor Company
IBM	IBM
MICRO	Microsoft
OUTO	Outokumpo Research Oy
SHER	Schering AG
SCHL	Schlumberger
SIEM	Siemens AG
TELE	Telenor ASA

From the above it would seem that the majority of female scientists working for IBM, the Ford Motor Company, Schlumberger and Schering AG are well supported and accommodated. The most popular measure for supporting women working within these R&D companies is the provision of flexi-time – in other words when the female employee can choose which working hours best suit her personal needs. Childcare facilities, teleworking and women's networks are also popular. A number of companies further enhance these efforts by specifically recruiting female researchers, internally raising awareness about the potential of women in SET and the challenges they face, and by assisting female employees with their career planning.

4.3 CONCLUSION

The conclusion can be drawn that various modes of intervention operating at various levels of intervention are required to holistically address the challenge of equal access and participation of women in SET. The most common modes of intervention can be grouped under the banners of policy interventions, gender mainstreaming, advocacy and interests groups, and the provision of training and support. Sweden and Norway are the current leaders in gender equity as issues of gender are entrenched in all policies, in all decision-making and at all levels of governance. Furthermore gender equality is valued and aspired too by the culture as a whole, by both men and women.

Policy interventions are needed at a regional, national and institutional level. At a regional level, the EC has been the most significant role player in designing and implementing policies aimed at increasing and facilitating the participation of women in SET. Their success can be attributed to having gained the political will and cooperation of various governments, adequate resources, sufficient structures and effective monitoring and evaluation (M&E) to strategically plan and redirect their policies and plans as the scenario has unfolded over the past 15 or so years. A clear policy shift is evident from an initial focus on determining the situation of women working in SET, and ensuring access through mainstreaming and other policies, to one more focused on facilitating participation where issues of work-life balance, equal reward and recognition and increasing the representation of women in SET leadership are highlighted. At national level the UK has duplicated much of what the EC proposes and it is due to a strong national strategy on women in SET that this country now houses one of the few worldwide resource centres (UKRC), running initiatives specifically focused on women and SET issues. Various other countries have taken this even further and have policies in place that also encourage and reward good gender equity policies and practices at institutional level.

To a huge extent gender mainstreaming is a result of strong gender policies. Gender mainstreaming to date has been fairly successful in increasing the access of women to SET, but the need for horizontal and vertical mainstreaming is stressed as well as the presence of necessary measures to implement and enforce. Once again much can be learnt from Norway who are currently the best example of successfully implementing gender mainstreaming in SET and also in taking the lead in gender budgeting. The complexity and value of mainstreaming also becomes apparent when an organisation such as UNESCO dedicates a complete unit to the subject (Gender Mainstreaming Resource Centre).

It would see that traditionally policies and mainstreaming are the first modes of intervention most commonly associated with increasing and facilitating the participation of women in SET. In support of these interventions, and sometimes due to a lack of policies and programmes, advocacy and interest groups organise themselves and provide the necessary pressure and support to bring about the required change. Such groups that are currently breaking ground and would be worthwhile learning from are WIRDEM and OWSD. Training and support would seem to be very popular especially at institutional and grassroots level. The most common forms of support include mentoring, the use of role models, in-service training and institutional and work-based support structures - both formal and informal. Although mentoring seems to be the most widespread form of support for women in SET, much more has to be done to ensure the sustainability of such programmes.

CHAPTER 5**RESEARCH DESIGN AND METHODOLOGY****5.1 INTRODUCTION**

When reference is made to '*initiatives/programmes/projects/interventions*' aimed at the very broad target group of '*women in SET*', the field is extensive and not clearly defined. In an attempt to contain this broad field the main methodology used was a documentary analysis consisting primarily of desktop literature searches, categorization, analysis and interpretation. A broad outline of the research questions and methods used is provided below.

Table 5.1: Outline of research questions, designs and methods

Research question	Research design	Research method
What causes the relative unequal participation of women in SET?	Internet research	Desktop literature search and collection of sources.
What initiatives are currently in place aiming to address these causes?	Internet research	Desktop literature search and collection of sources. Initial categorization and coding.

The following sections discuss the methods used for data collection, analysis and interpretation in more detail.

5.2 DATA COLLECTION AND CAPTURING**5.2.1 Data collection**

As there is currently no body of knowledge indicating exactly how many initiatives exist aimed at addressing the causes of the unequal participation of women in SET and no specific parameters to describe or compare them, it was decided to conduct a broad desktop search. This search aimed to collect as many references as possible to initiatives addressing either the easing or increasing of participation of women in SET.

The persistent issues regarding qualitative data, highlighted by the literature, were considered for this study and include the labour-intensity of data collection, processing and coding; data overload; and researcher bias in selecting and coding of data (Miles & Huberman, 1994). Nesse-Biber and Leavy (2011) point to the major advantage of working with non-living data in that the data is non-interactive, it therefore exists independently of the research and the researcher thus giving it a unique level of authenticity.

The search started with hard copy reviews of resources located within CREST at US and the US library, also the library of the Human Sciences Research Council (HSRC). Various online sources were also consulted using EbSCOHost Premier as the main search engine. As in the case with the CREST Study of Women in SET (2004), the information collected was on an international level and

was based almost entirely on Internet searches as it provided the most up-to-date picture of women in SET worldwide, which is both immediate and extensive. As Sapsford (2006) points out the Internet also further gives us the advantage of reviewing various sources that would otherwise have been too time-consuming and costly to research and allows us access to sources that might otherwise have only been available at a local level and gives as examples government websites, university sites and sites dedicated to individual research projects.

Bailey et al (2004:47) however highlights the following important limitations of this manner of data collection:

- The limited control over the scope and the level of accuracy of the information collected.
- The idiosyncratic nature of websites.
- Varying structures and content of websites meaning that comparison is sometimes problematic and that some initiatives might not even receive a mention on certain sites.
- Advanced First- World countries, such as the UK and the US, which have unlimited access to infrastructural resources, obviously have greater representation on the World Wide Web and this creates some bias in coverage.
- Web pages are not always well maintained, with the result that the information contained is outdated or the website is not accessible due to linking or construction problems.
- Internet searches are also limited by language as most websites that are not in English are of limited use to non English-speaking researchers, again creating some bias in coverage towards English-speaking countries.
- The website information has not been verified.

Given these limitations, it is important to note that the probability exists that a number of interventions might not have been covered in the study and that the study is by no means exhaustive in its coverage. Rather, taking into consideration the limited summative literature available, this is a first attempt at providing some structured overview of what the current landscape looks like.

The decision was subsequently made to review the websites of various governments, government departments and agencies, funding agencies, not-for-profit organisations and universities and university units working within the field of S&T and gender studies. A number of online journals were also reviewed such as *Science, Technology and Human Values; Issues in Science & Technology; Scientometrics, Technovation, Science & Public Policy; Journal of Science; and the International Journal of Social Research Methodology*. Online searches included various combinations of the following keywords: *science, science & technology, science, engineering & technology; scientific workforce, strategies, participation, gender, male, female, women, age, race, career experiences, access, participation, production, reward, inequity, researchers, quantitative indicators, qualitative indicators, publication output, knowledge production, and gender mainstreaming*.

All initiatives mentioned within the literature were also then ‘googled’ to determine if specific websites existed for these programmes/projects. The decision regarding which initiatives to include as part of the sample was based on the volume of available online information for each; on the credibility of the source; and whether the majority of variables mentioned in *Table 5.2* (initiative summary framework) could be populated to some degree of satisfaction. Furthermore, a decision was also made to include only interventions that clearly targeted the SET sector. The result of this was that certain interventions that might indirectly impact on the participation of women in SET were excluded from the study. The ever-changing nature of the World Wide Web does imply that by the time this study is completed, new initiatives have most probably been written up and posted on the web and that some of the information presented here would already be dated.

The initial literature review and scan of initiatives revealed that there are various initiatives focused on increasing and/or facilitating the participation of women in SET, but that the majority do not explicitly state their goals and objectives and specific target groups, and also that most have not been evaluated in terms of impact. It was therefore decided to design an ‘initiative summary framework’ and a data-capturing instrument in an effort to provide some structure for the capturing, analysis and reporting of the data.

5.2.2 Data capturing

Each initiative included in the database was summarized using the framework presented in *Table 5.2*. The framework was constructed once all the literature had been reviewed and some general variables were identified that appeared in most of the descriptive material. The selected variables would potentially provide a representative picture of where initiatives are being implemented, at which level of influence, by whom, for whom, for what reason; and by what means. The complete volume of summaries is provided in *Appendix B*. This was then followed by a process of populating the summaries and starting to identify more specific variables and categories that could be used to capture the relevant features of each initiative in a manner that would allow some comparison and generalization.

Table 5.2: Initiatives summary framework

Variable	Description	Categories
Name		
Country		
Level of intervention	At which level of influence does the initiative aim to work?	Local/grass roots level. Institutional level. National or policy level. International level.
Driver	Which individuals/groups are driving the implementation of the initiative?	Public sector/government. Academia. Industry. NPO sector and funding organisations.

Sector focus	Is there a specific sector the initiative is targeting?	
Target group	Does the initiative specify a particular grouping to be targeted?	<p>School girls.</p> <p>Students.</p> <p>Women working in SET generally.</p> <p>Women working in specific sectors (e.g. HE, engineering, IT).</p> <p>Entry-level young scientists.</p> <p>Senior women in SET.</p> <p>Returners.</p> <p>Employers.</p> <p>Policy and decisionmakers.</p> <p>Others.</p>
Type of intervention	What is the primary nature of the intervention?	<p>National strategy/programme.</p> <p>Information dissemination.</p> <p>Education and training.</p> <p>Networking and support.</p> <p>Research project.</p> <p>Award scheme.</p> <p>Funding programme.</p> <p>Association/grouping/coordinating body.</p> <p>Other.</p>
Description	Primary goal and objectives	<p>Awareness raising/making the case.</p> <p>Increasing access.</p> <p>Expanding participation.</p> <p>Increasing probability for progression.</p> <p>Increased support.</p> <p>Improved retention.</p> <p>Increased representation/gender equity.</p> <p>Monitoring and evaluation of participation.</p>
Activities	What activities are implemented to achieve the goals/objectives?	<p>Information collection and dissemination.</p> <p>Education and training activities.</p> <p>Mentoring activities.</p> <p>Support and networking activities.</p> <p>Awareness-raising and profiling.</p> <p>Advocacy and lobbying.</p> <p>Financial assistance.</p> <p>Research and analysis.</p> <p>Career development and human resource development activities.</p> <p>Policy review and development.</p> <p>Other.</p>
Intended outcomes	What changes does the initiative want to bring about?	<p>Increased awareness of abilities.</p> <p>Increased awareness of barriers.</p>

		Increased access. Increased participation. Support through scientific career. Increased gender equity. Improved career advancement. Professional development. Increased recognition. Improved retention. Improved monitoring and evaluation of participation. Other.
Evaluation	Has any formal monitoring and evaluation of the initiative been undertaken, and if so what lessons have been learnt and improvements made?	
Sources		

Miles and Humberman (1994) suggest a data-capturing tool that brings together all items related to the same overarching themes on a MS Excel spreadsheet, which then allows for comparison between cases and variables and the provision of some indications for future data analyses. Furthermore, by reading across rows, this approach allows the researcher an initial profile of each case (initiative for this study) as they relate to the different variables, and reading down the columns provides a summative and comparative picture of variables. To structure this process a data-capturing template was designed. The initiatives were coded as numerical data and captured in an MS Excel spreadsheet. Following the capturing of data from all initiatives, each field in the database was thoroughly checked and cleaned to reduce possible data-capturing errors or discrepancies.

The final data-capturing instrument was modified a number of times as the data coding and capturing advanced, as variables and variable categories were adjusted and as recoding and capturing of initiative summaries was made. This reassigning of variables and codes was due to the fact that the majority of initiatives were not clearly defined and described in terms of variables with the result that certain variables were easy to categorise and others were rather vague and had to be revisited a number of times. The bulk of initiatives is focused on a number of objectives, outcomes and target groups; is driven by a combination of drivers; and utilises various types of activities. Therefore, categories are not mutually exclusive - with the result that each initiative can be classified in a number of categories per variable and therefore the variable categories are indicated as additional columns in the dataset. The majority of Initiatives could be classified across a combination of categories per variable and the decision was made to assign each possible variable and category applicable to the relevant initiative. The various variable categories are defined and explained in greater detail as part of the findings in *Chapter 6*. Each of the more complex variable categories is described in detail as they relate to each of the variables within the given context. The choice of variables and categories

were also selected and presented to create some continuity and linking with the main causes for the relative unequal participation of women in SET as identified and presented in *Chapter 2*.

A total of 123 initiatives were reviewed. Of these 104 are complete programmes and 19 are sub-projects related to over-arching programmes. The list of initiatives that was recorded is provided in *Table 5.3*. The listing is provided per broad geographic location and is numerically numbered as ordered in *Appendix B* should the reader want to review more details about any of the initiatives.

Table 5.3: List of initiatives

Europe General	
1. Helsinki Group on Women and Science	-
2. Central European Centre on Women and Youth in Science	CEC-WYS
3. Centre of Excellence Women in Science	CEWS
3a. European Platform of Women Scientists	EPWS
3b. <i>Career Strategies for Women in Science</i>	-
4. Third World Organization for Women in Science (now organisation for women in science for the developing world)	TWOWS OWSD
5. European Association for Women in Science Engineering and Technology	WiTEC
6. European Network of Mentoring Programmes	Eument-net
7. Dialogue and Action for Gender Equality & Research Excellence in European Science – women in science	genSET
8. Gender Debate in the European Research Area	GENDERA
9. SET-Routes	-
10. Practising Gender Equality in Science	PRAGES
11. Empowering Women Engineers Careers in Industrial and Academic Research	PROMETEA
12. Towards Women in Science and Technology	TWIST
Other European	
Germany	
13. Strategies for enforcing equal opportunities for women in education and research	-
14. Frauen in Naturwissenschaft und Technik	NUT e.V.
15. Competence Center Technology-Diversity-Equal Chances	Kompetenzzentrum
16. Conference of Equal Opportunities at universities and academic institutions in Baden-Württemberg	LaKOG
17. Integration Team – Human Resources, Gender and Diversity Management	IGaD (RWTH Aachen)
Belgium	
18. Belgian Women in Science	BeWise
Netherlands	
19. Aspasia	-
Austria	
20. Department of Gender Issues FWF (Austrian Science Fund)	-
21. Center for Gender Equality (University of Vienna)	-
Switzerland	

22. Swiss federal programme for gender equality in universities	-
23. Association of Feminist Science Switzerland	FemWiss
24. Swiss-German Mentoring Programme	-
25. Bienvenue au Réseau romand de mentoring pour femmes	-
26. Le Mentorat (Geneva University)	-
27. Women in Industry	WIN
28. netz+ - HSG Women (University of St Gallen)	-
Sweden	
29. Swiss National Research Council	SNSF
30. VINNMER Fellows	-
United Kingdom	
31. The Strategy for women in SET	-
31a. UK Resource Centre for Women in SET	UKRC
31b. Website of statistics on women in SET	-
31c. Expert Women's Database	-
31d. Athena Project	-
31e. Local Academic Women's Networks	-
31f. Royal Society's annual Rosalind Franklin Award	-
31g. The Women Returners Study	-
31h. Association for Women in Science and Engineering	AWiSE
31i. European Database of Women Experts in Science, Engineering and Technology	WITEC database
31j. Portia	-
31k. UKRC Return Scheme	-
31l. Jive Partners	-
32. Women in Higher Education Register	-
33. Women's Engineering Society	WES
33a. Mentoring Scheme for Women in Science, Technology, Engineering and Mathematics	Mentorset
34. Daphne Jackson Trust	-
35. The University of Cambridge Women in Science, Engineering and Technology Initiative	WiSETI
36. North West University Mentoring Scheme	MENWU
Ireland	
37. Women in Technology and Science	WITS
38. Principal Investigator Career Advancement Award	PICA
39. Centre for Women in Science & Engineering Research (Trinity College Dublin)	WiSER
Scotland	
40. Scottish Resource Centre for Women in Science, Engineering and Technology	-
Czech Republic	
41. The National Contact Centre – Women and Science	NkC
Spain	
42. Women and Science Unit (Ministry of Science and Innovation)	UMYC
Portugal	

43. Portuguese Association of Women Scientists	Amonet
Greece	
44. Periktioni Network of Women Scientists	-
45. Greek Women's Engineering Association	EDEM
46. Impowering for a Choice	IFAC
Baltic States	
47. Baltic States Network of Women in Science	BASNET
Asia General	
48. Asia Pacific Gender Equity in Science and Technology Program	APGEST
49. Korean National Institute for Supporting Women in Science and Technology	IS-WIST
Malaysia	
50. Technology Acquisition Fund for Women	TAF-W
Japan	
51. Society for Japanese Women Scientists	-
India	
52. The Women Scientists Scheme	WOS
53. Technology Parks for Women	-
54. Conference of Women Scientists and Technologists: Role in National Development	-
Finland	
55. WomenIT	-
56. Women of Learning	-
Norway	
57. Committee for Gender Balance in Research	KIF Committee
57a. Gender Equality Award	-
58. Gender Equity at Norwegian University of Science and Technology	-
United States of America	
59. Society of Women Engineers	SWE
60. Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring	PAESMEM
61. ADVANCE Institutional Transformation Program	-
62. Mentornet	-
63. Women in Science Program	WISP
64. Women in Science at Yale	WISAY
65. Dartmouth Women in Science Project	WISP
66. Case Western Reserve University – Academic Careers in Engineering & Science Mentoring	ACES
67. Centre for Study of Women, Science & Technology at Georgia Institute of Technology	WST
68. Association for Women in Science	AWIS
69. Women in Science and Technology	WIST
70. Wisconsin Women in Higher Education Leadership	WWHEL
71. Flora Stone Mather Center for Women (Case Western Reserve University)	FSM

72. Women in Science and Engineering (University of Southern California)	WISE
73. Office of Women in Higher Education	OWHE
74. University of Alberta – Women in Science and Engineering	UA-WISE
75. Duke Women in Science and Engineering	WISE
76. CareerWise (Arizona State University)	-
77. Scientiae-carnival	-
Canada	
78. Women in Scholarship, Engineering, Science and Technology	WiSEST
79. Canadian Coalition of Women in Engineering, Science and Technology	CCWEST
80. Society for Canadian Women in Science and Technology	SCWIST
81. The Computer Research Association's Committee on the Status of Women in Computing Research	CRA-W
82. The Women in Engineering Programs & Advocates Network	WEPAN
83. The Chairs on Women in Engineering in Universities	CWSE
84. University Faculty Awards	UFA
Africa General	
85. The Female Education in Mathematics and Science in Africa	FEMSA
86. African Women in Engineering and Science	-
Kenya	
87. Kiriri Women's University of Science and Technology	-
Uganda	
88. Department of Women and Gender Studies Makerere University	-
89. Association of Women Engineers, Technicians and Scientists in Uganda	WETSU
Ghana	
90. Science clinics	-
South Africa	
91. South African Association of Women Graduates (SAAWG)	SAAWG
92. Higher Education Resource Services South Africa	HERS-SA
93. Thuthuka Programme	-
93a. Women-in-Research	W-I-R
94. Forum for African Women Educationalists South Africa's professional development programme	FAWESA
95. Technology and Human Resources for Industry Programme (THRIP)	THRIP
96. The Carnegie Corporation of New York's International Development Programme (IDP) – Enhancing women's opportunities in HE	IDP
97. South African Women in Science Awards	WISA
98. Association of SA Women in Science & Engineering	SAWISE
99. Women in IT – SA	-
100. Women in Engineering Forum	-
Australia	
101. Women in Science Enquiry Network	WiSENET
102. Women in Engineering	WIE
International	

103a. UNESCO-Women and Science: UNESCO Chairs 'Women, Science, Technology and Development'	-
103b. L'OREAL-UNESCO For Women in Science	-
104. Global Alliance for Diversifying the Science and Engineering Workforce	-
105. American Association for the Advancement of Science - International Initiatives	AAAS

5.3 DATA ANALYSIS AND INTERPRETATION

Miles and Huberman (1994) define analysis as consisting of three simultaneous streams of activities namely data reduction, data display and conclusion drawing. Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up format. This process was conducted in the summarising of the various initiatives into the initiatives summary framework. Data display refers to the organisation of this reduced data into an immediately accessible, compact form so that certain decisions around analysis can start to take form, for example, the deciding on the rows and columns of a matrix for qualitative data and deciding which data, in which form, should be entered into the cells. Bernard and Ryan (2010) refer to this as data management consisting of records (the units with characteristics one wishes to retrieve) and fields (the characteristics or variables under investigation). This was done during the capturing of the various summarised initiatives into the MS Excel spreadsheet with each initiative representing a record/row and then coding each as present or absent for each of the variables. Although the primary methodology used for this study is not content analysis in its traditional form some elements are present. Nesse-Biber and Leavy (2011) explain that traditionally content analysis referred to the methodical assessment of written texts. Originally this practice was then also quantitative in nature, and researchers would count the incidence/rate/amount of the particular subject. The more modern thinking is that of a hybrid between qualitative and quantitative research. The primary method borrowed from content analysis for this study is the process of "quantizing", in that qualitative data is transformed into quantitative data that can then be presented in easily comprehensible tables and charts.

Analysis is the search for patterns in data and for ideas that help explain why those patterns are there in the first place (Bernard & Ryan, 2010). Contingency tables and descriptive statistics were used for the majority of analyses. The cleaned MS Excel dataset was used to create various contingency tables to cross-tabulate the variables or in other words to summarise the relationship of one variable to another.

The data were interpreted by observing patterns and relationships in the various contingency tables in order to provide a more structured review of initiatives for women in SET. Data were interpreted with regard to (1) the geographic coverage; (2) the level of intervention; (3) the drivers of initiatives; (4) the various target groups; (5) the objectives and intended outcomes of initiatives; and (5) the type of initiatives and their core activities. The data were further interpreted in terms of addressing the main causes for the relative unequal participation of women in SET namely unequal access, the male-

dominated nature of science, tension of reconciling professional and private life, differences in recognition and reward, and the lack of female representation in leadership.

CHAPTER 6

EMPIRICAL DATA AND FINDINGS

6.1 INTRODUCTION

A total of 123 initiatives related to gender and science were reviewed for this study. Of these, 104 are complete programmes and 19 are sub-projects related to an overarching programme. The list of initiatives that were recorded is presented in *Table 5.3*. The listing is provided per broad geographic location and is numerically numbered as ordered in *Appendix B*. Each initiative was summarised using the initiative summary framework presented in *Table 5.2* and then populated in terms of *objectives, intended outcomes, type of initiatives, core activities, level of intervention, drivers* and *target groups*. Although the majority of initiatives are not explicit about addressing the main causes for the unequal participation of women in SET, an attempt was made to also populate and interpret these findings where relevant.

The bulk of initiatives is focused on a number of objectives, outcomes and target groups; is driven by a combination of drivers; and utilises various types of activities. Therefore, categories are not mutually exclusive - with the result that each initiative can be classified in a number of categories per variable. To simplify the presentation of the findings the data is presented related to (1) the geographic coverage; (2) the level of intervention; (3) the drivers of initiatives; (4) the various target groups; (5) the objectives and intended outcomes of initiatives; and (5) the type of initiatives and their core activities. This provides a general picture of where initiatives are being implemented, at which level of influence, by whom, for whom, for what reason; and by what means. In certain instances, a few further cross-tabulations are presented to enhance the discussion of the particular variable under review. This is done in an attempt to pull the data together and present a collective picture of initiatives aimed at increasing and facilitating the participation of women in SET.

The chapter concludes with an overview of how the various causes for the unequal participation of women in SET are being addressed by the identified interventions.

6.2 OVERARCHING FINDINGS

This section of the chapter summarises the various initiatives in terms of geographic coverage, level of intervention, drivers, target groups, objectives and intended outcomes as well as type and core activities. In the original summary framework and the initiatives database, initiative objectives and intended outcomes are indicated as separate variables but are discussed as one variable as they were found to be almost similar in the final analysis. The type of initiative is interconnected with its core activities and is therefore presented under the same heading.

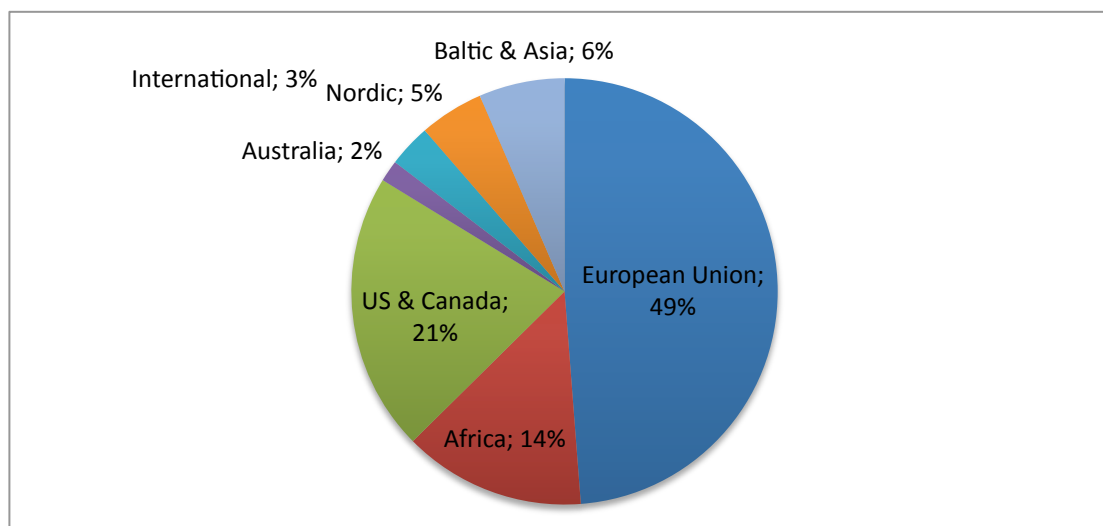
Two questions that are included in both the summary framework and the initiative database but not discussed in any further detail are: (1) whether the initiative targets a specific sector and (2) whether

any formal evaluation of the initiative has been undertaken. In terms of sectors, the findings indicate that slightly more than 45% of initiatives are focused on women within a particular subsector of SET, most notably women working in higher education, public research institutions, engineering and information technology (IT). It is of concern that of the 123 reviewed initiatives, only 26% have undergone some form of evaluation.

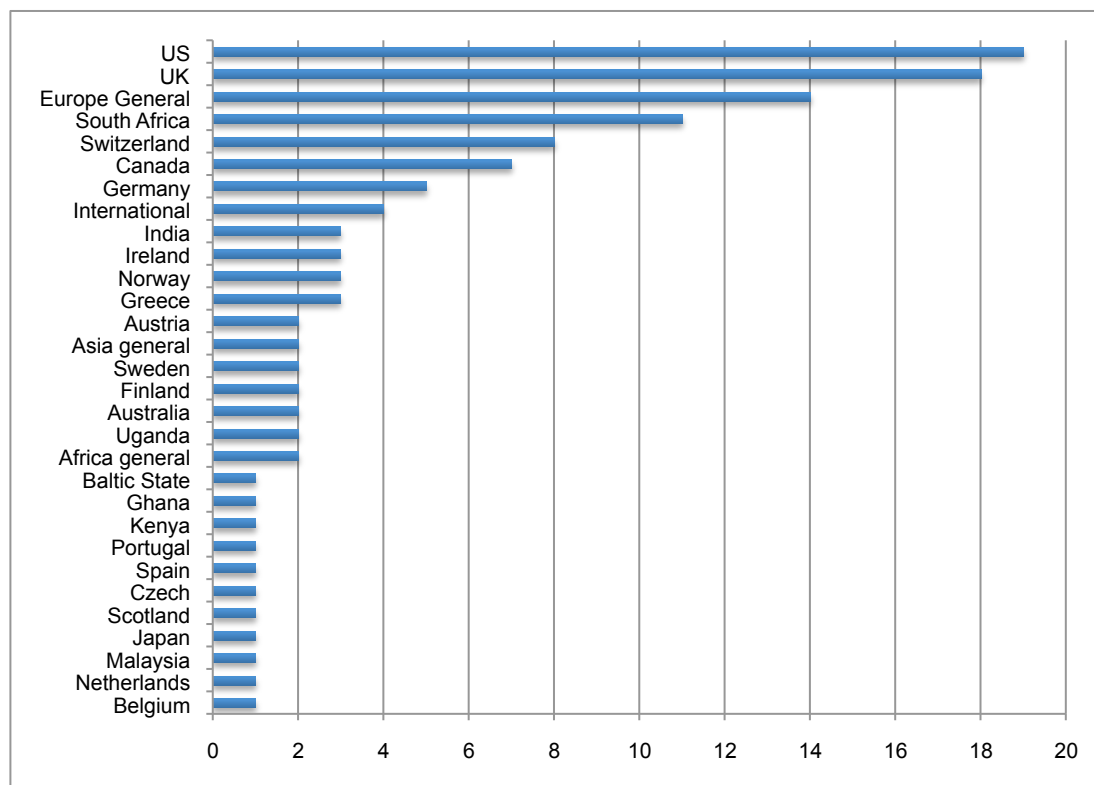
6.2.1 Geographic coverage

As *Figure 6.1* indicates, almost half of all initiatives are active within Europe (49%). This is not surprising, as this region first addressed the topic and initiatives are now well established. Within the European Union the breakdown of initiatives per country is: UK (32%), Europe General (24%), Switzerland (13%), Germany (8%), Ireland and Greece (5% each), Austria and the Netherlands (3% each) and Belgium, Scotland, Czech Republic, Spain, and Portugal (just more than 1% each). The US and Canada follow with 21% representation of all initiatives; made up by 75% for the US and 25% for Canada. Coverage on the African continent is predominantly located within South Africa (65% of Africa total) with the remaining initiatives located within Kenya, Uganda and Ghana. The Nordic region is represented by Norway (43%), Finland (29%) and Sweden (28%). The Baltic States and Asia collectively cover 6% of all initiatives and coverage includes India (38%), Asia General (25%), and the Baltic region, Malaysia, Japan and Korea (12% each). Initiatives located within Australia represent 2% of total initiatives and 3% of all initiatives have an international focus.

Figure 6.1: Regional coverage of initiatives for women in SET



The coverage per region is not necessarily a reflection of how progressive a region is in addressing the main causes related to the unequal participation of women in SET, but rather a geographic representation of where some activities are taking place. An example of this is the Nordic region - a very small but an extremely progressive region when it comes to legislative and institutional reform on gender and SET issues. A country like Spain has been inactive in this arena for a long period but has recently started to bring about reforms at national and institutional levels that have had a significant effect on women's participation in SET, particularly so in the area of women and governance in SET.

Figure 6.2: Number of initiatives per country for women in SET

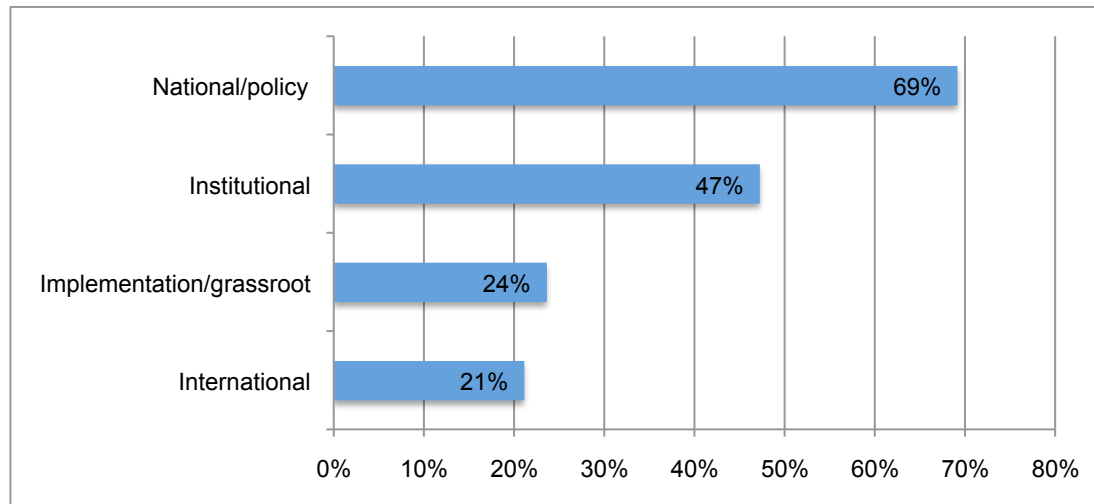
6.2.2 Level of intervention

The *level of intervention* refers to the level at which the initiative aims to influence or bring about change for women in SET. The following levels are distinguished: international, national/policy level, institutional level and grassroots level. International level would include initiatives that span across continents and borders and aim to influence the SET field as a collective. National and/or policy level includes initiatives that aim to influence their immediate regional and local governments' manner of addressing the needs of women in SET. Institutional level within this context refers mainly to initiatives housed and mostly managed by higher education institutions, public research councils and facilities and private research institutions focused mainly on influencing their internal policies and practices. Grassroots level refers to a level of influence working from the 'bottom-up', thus initiatives that are principally driven by interest groups, concerned citizens and women working in SET and are mostly housed within the private and NPO sectors.

As *Figure 6.3* indicates the majority of interventions (69%) are aimed at bringing about change at a national or policy level. Two such examples are the *Scottish Resource Centre for Women in Science, Engineering and Technology* and the *Korean National Institute for Supporting Women in Science and Technology (ISWIST)*. The Scottish Resource Centre aims to support both participation and progression of women in SET; they do this through providing accessible services for women working within the sector, for potential returners to the sector and for membership organisations, professional associations and employers. ISWIST focuses on helping women professionals in SET throughout their careers. They conduct an annual investigation into the status quo of women in the sector,

providing a unique survey on gender recognition and a statistical database used for policy development. Their work, including the report that is approved as a national statistic by Statistics Korea, has raised awareness around a variety of issues including the temporary nature of many jobs for women in SET.

Figure 6.3: Level of intervention of initiatives for women in SET



The next most prevalent level of intervention refers to initiatives that aim to change the access and experience of women in SET at an institutional level (47%) and are mostly located within higher education institutions. A few initiatives are also aimed at bringing about change at the grassroots level (24%) and remaining initiatives aim to address the issues women in SET face in the international arena (21%).

Table 6.1 indicates that almost a quarter of all initiatives have both a national and institutional focus. On closer investigation this is explained by the fact that government departments, academic councils and higher education institutions drive most national and regional initiatives, with government departments designing the policy and legislative framework and the academic institutions being the first to implement. As mentioned previously the grassroots level refers to the private and NPO sectors. It can therefore be assumed that the 15% of initiatives that have both a national and grassroots level focus speak to those initiatives that have a national policy framework and strategy that provides some incentive for industry's adherence to reform to such national policy. Initiatives that aim to influence the international arena in 13% of the cases also aim to trickle down to the regional and national level. The *Global Alliance for Diversifying the Science and Engineering Workforce* is a collaborative initiative of the American Association for the Advancement of Science (AAAS); Women in Engineering Programs & Advocates Network (WEPAN); and the Association for Women in Science (AWIS). The Alliance aims to support efforts to diversify the SMET workforce and they do this by collaborating on an international stage with higher education institutions, NGOs, corporations and governments. They feel that a diverse SMET workforce will facilitate the development of a long-term sustainable infrastructure that will impact on a regional/national and international level.

The 9% of initiatives that have both an institutional and grassroots focus are those initiatives that have some sort of link with higher education institutions and industry and in most cases are linked to a specific subsector, for example engineering and IT. An example of such partnerships is found in *JIVE Partners: A five-year project that has addressed occupational segregation in the science, engineering, construction and technology (SECT) sectors. JIVE is a partnership of organisations across the UK which has developed new ways to tackle the issues of the under representation of women in SECT sectors, across education and industry. JIVE has influenced thousands of people throughout the partnership – young women choosing the subjects they study; careers professionals changing the advice they give; lecturers adapting how they teach; employers changing their company policy and practice; women choosing to return to work in science, engineering, construction and technology.*

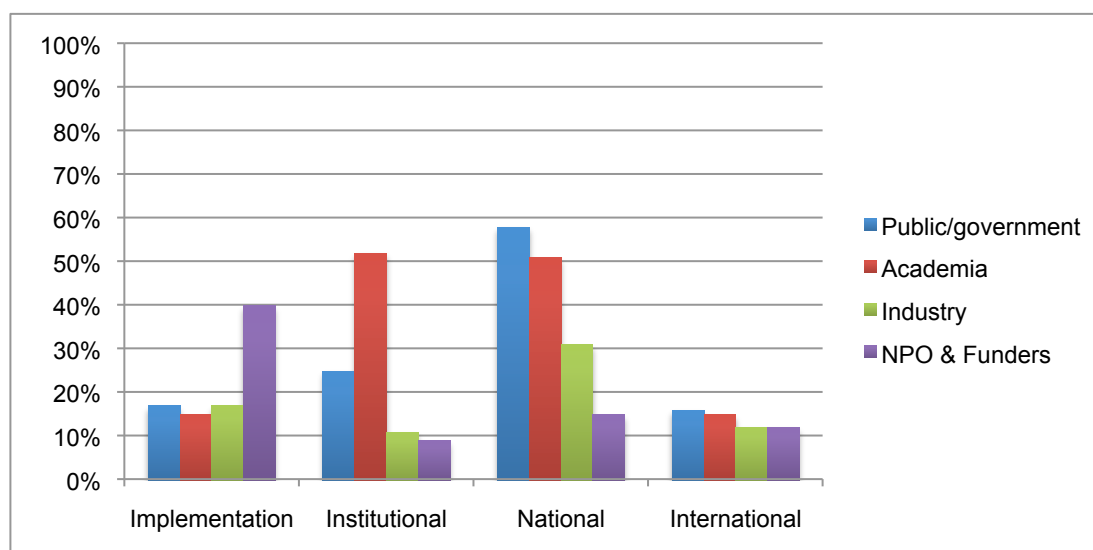
Table 6.1: Cross tabulation of level of intervention of initiatives for women in SET

	Implementation/ Grassroot	Institutional	National/ Regional	International
Implementation/Grass-root	23%	9%	15%	3%
Institutional	9%	47%	24%	5%
National/regional	15%	24%	69%	13%
International	3%	5%	13%	23%

Drivers per level of intervention

Although the following section looks more closely at the drivers of initiatives, some references have already been made to the various role players involved at the different levels of influence. To put this into perspective *Figure 6.4* lists these drivers per level of intervention.

Figure 6.4: Drivers per level of intervention of initiatives for women in SET

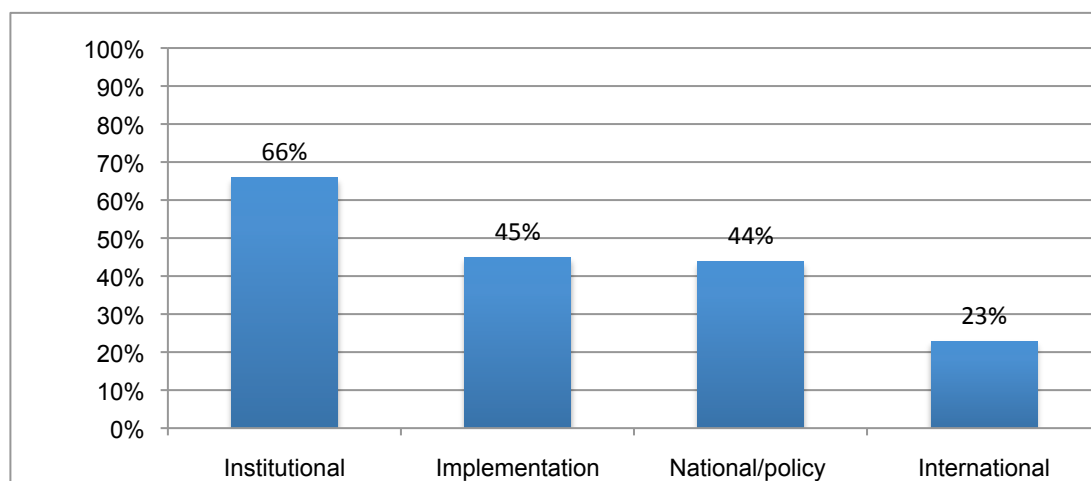


Public institutions/government departments and academia drive the majority of initiatives aimed at bringing about change at a national level. At institutional level academia are typically the drivers of initiatives for women in SET with government departments and institutions also combining their efforts. It is interesting to note that the few international initiatives are driven by a combination of government, academia, industry and NPO and funding agencies.

Sector specific focus per level of intervention

As *Figure 6.5* indicates most initiatives with an institutional reach are focused on a specific sector, for example engineering, IT, biotechnology, etc. and are most probably located and managed within a specific faculty or department. Almost half of all initiatives aimed at national level and grass root levels are directed at a specific sector, while initiatives aiming to bring about change internationally are focused more on SET generically.

Figure 6.5: Sector specific focus per level of intervention for initiatives for women in SET



Target group per level of intervention

Table 6.2 summarises the relationship between the level at which initiatives operate and the target group they aim at. Initiatives with a national reach are predominantly targeted at policy and decisionmakers as well as at the general population of women working in SET (55%) and women working in specific sectors within SET (54%). National initiatives also strongly target female students (53%) and entry-level scientists (49%) in efforts to direct them towards a career in SET. It is promising that at this level of intervention, the focus is on senior women in SET with 40% of initiatives identifying this specific group as one of their targets. At institutional level the target groups look somewhat similar. At grassroots level the primary target group is women generally working in SET (52%), followed by students (45%) and entry level scientists (41%) whom industry is attempting to attract and ease into the SET field. International initiatives mostly identify policy and decisionmakers (46%) and women working in SET generally (39%) as primary target groups, thus spreading the influence from both a top-down and bottom-up approach.

Table 6.2: Target group per level of intervention of initiatives for women in SET

	<i>Implementation/ grass root</i>		<i>Institutional</i>		<i>National/policy</i>		<i>International</i>	
<i>Target group</i>	N	%	N	%	N	%	N	%
School girls	8	28	10	17	24	28	7	27
Students	13	45	25	43	45	53	7	27
Women working in SET general	15	52	13	45	47	55	10	39
Women in specific sector	7	24	30	52	46	54	5	19
Entry level young scientists	12	41	21	36	42	49	6	23
Senior women in SET	7	24	18	31	34	40	3	12
Returners	5	17	4	7	12	14	0	0
Employers	3	10	5	9	16	19	3	12
Policy and decisionmakers	8	28	18	31	47	55	12	46
Other	4	14	0	0	10	12	3	12

*Note= All percentages are calculated by dividing the number of initiatives that indicate a particular level of intervention focused on a particular target group, by the total number of initiatives that focus on the said level of intervention. Example: In total there are 29 initiatives that indicated a grassroots level of intervention. Of these 8 indicated school girls as a target group. 8 initiatives are then divided by the total of 29 possible initiatives indicating that 28% of all initiatives that have a grass root level of intervention are focussed on school girls. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

6.2.3 Drivers of initiatives

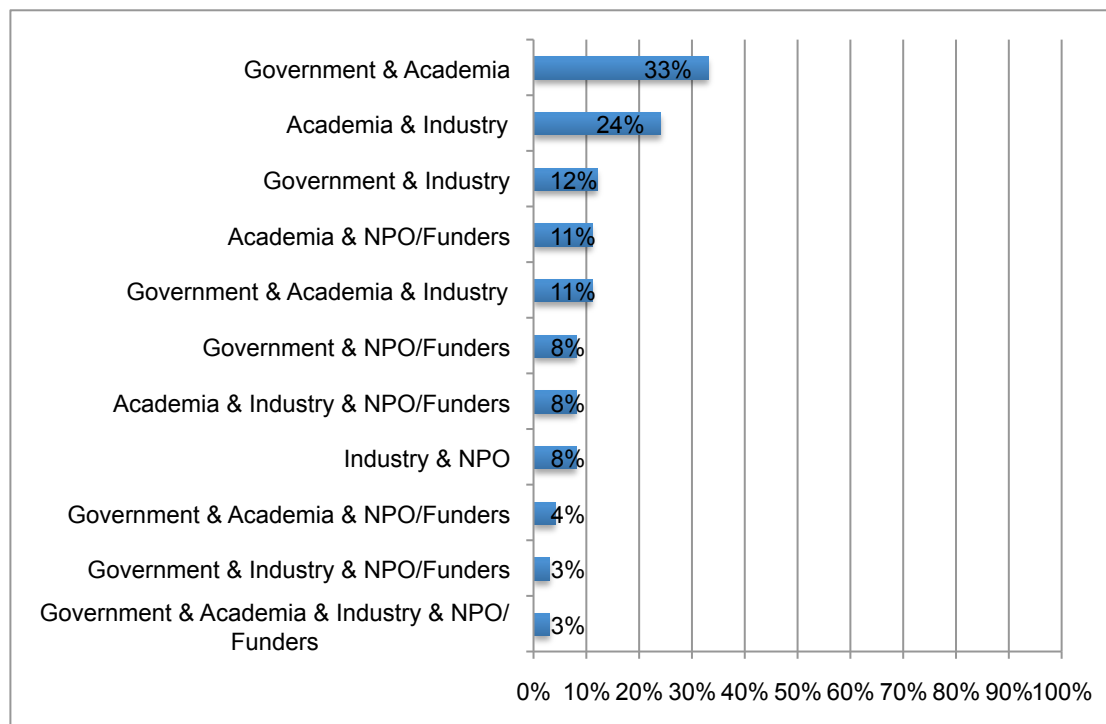
Closely related to the level of intervention are the drivers of these initiatives, in other words, those who take responsibility for steering and implementing the programmes and projects. Drivers are categorised as public/government sector (including public research institutions), academia (active within the higher education sector), industry and the NPO sector (including funding organisations).

The majority of initiatives are driven by academia (67%), followed by government and public institutions (58%). As is evident from the previous section, the involvement of industry and the NPO and funding organisations is somewhat less visible. It must be reiterated that cognisance has to be taken of the fact that coverage of the private sector in this study is probably under-represented as most companies document their initiatives for women in SET internally. These will therefore not be included in the study unless an initiative has been specifically mentioned on a website or if it forms part of a broader initiative.

Table 6.3: Drivers of initiatives for women in SET

	N	%
Public/government	71	58
Academia	82	67
Industry	39	32
NPO/funding organisations	23	19

When reviewing the combination of drivers, *Figure 6.6* indicates that the majority of programmes (33%) are jointly driven by government and academia. A further 24% of initiatives are driven by academia and industry, seemingly indicating academia as the middleman bringing the various role players together. The most unlikely combination of drivers is government, academia, industry and the NPO and funding organisations.

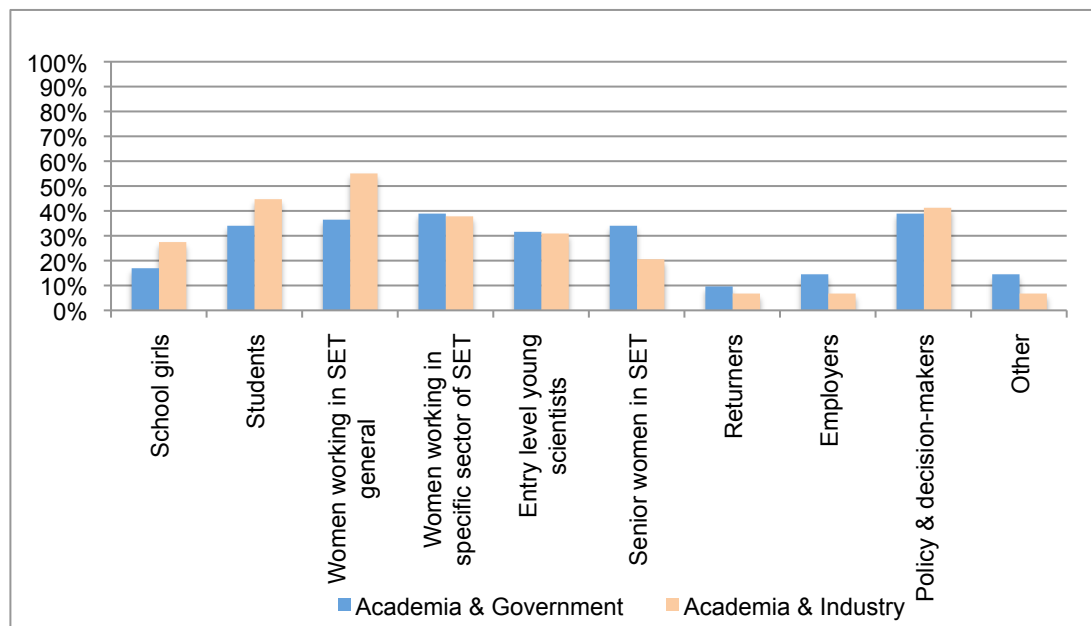
Figure 6.6: Combination of drivers of initiatives for women in SET

Target group per drivers of initiatives

Figure 6.7 shows that initiatives that are jointly driven by academia and government are targeted most intently at policy and decisionmakers and women working in specific sectors of SET (39%). For initiatives that are jointly driven by academia and industry, the most important target group are women working in SET generally (55%), followed by students (45%), policy and decisionmakers (41%) and

women working in particular sectors of SET (38%). Interestingly, neither combination focuses much attention on returners or employers specifically.

Figure 6.7: Combination of drivers by target group of initiatives for women in SET



6.2.4 Target groups

The target groups most commonly identified by initiatives are school girls, students, women generally working in SET, women working in a specific subsector of SET, entry-level young scientists, senior women in SET, returners, employers and policy and decisionmakers (public and private). Initiatives for women in SET have a fairly even spread across all these target groups with no particular target group receiving a disproportionate amount of attention, (*Table 6.4*). This most probably points to the generic nature of many of the initiatives, and that the majority of initiatives rather focus on a number of target groups to achieve their intended outcomes.

Groups that are targeted more commonly are the general population of women working in SET, women working in specific subsectors of SET, policy and decisionmakers, SET students and entry-level young scientists. This resonates well with the previous section that identified government and academia as the main drivers of these initiatives and that most are focused on the national and institutional level of intervention. An obvious gap in the field is evident when it comes to addressing the needs of female scientists wanting to return to a career in SET after a period of absence (only 10% of initiatives).

Table 6.4: Target group of initiatives for women in SET

	N	%
School girls	24	20%
Students	45	37%
Women working in SET general	47	38%
Women working in specific sector	46	37%
Entry-level young scientists	42	34%
Senior women in SET	34	28%
Returners	12	10%
Employers	16	13%
Policy and decisionmakers	47	38%
Other	10	8%

The majority of initiatives have two distinct target groups (32%), followed by initiatives with a single target group (24%), initiatives with three target groups (17%) and initiatives with four target groups. There is no significant variation in the combination of target groups across the number of target groups identified per initiative.

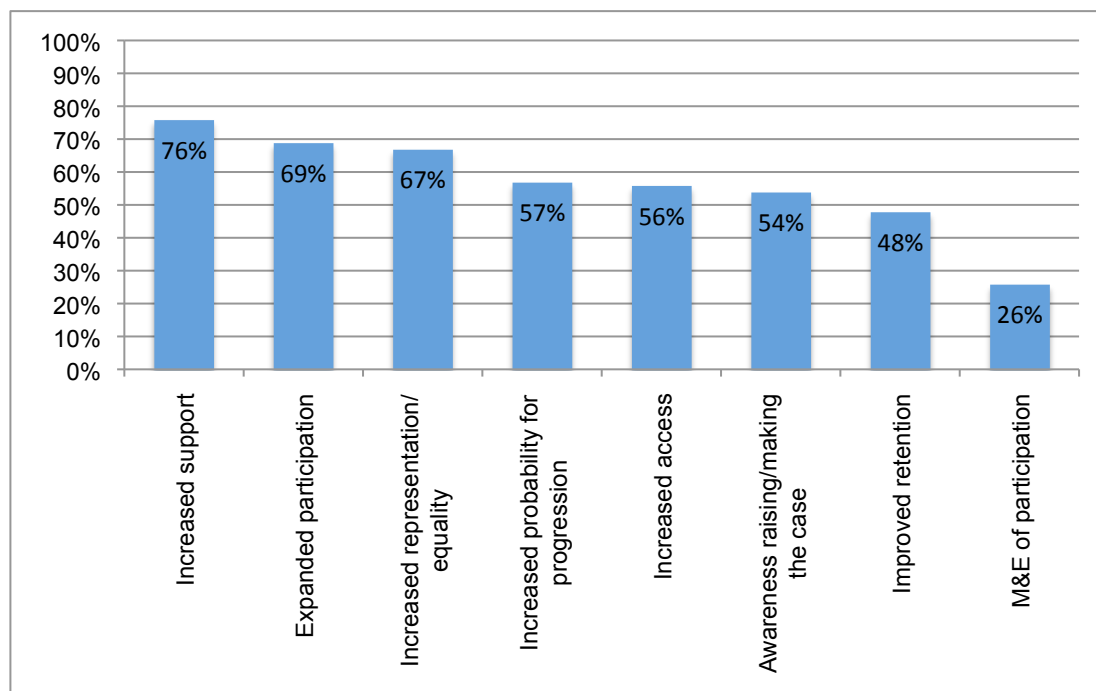
Figure 6.8: Number of target groups per initiative for women in SET

6.2.5 Objectives and intended outcomes of initiatives

The various initiatives identified the following categories of objectives/ intended outcomes when describing themselves:

Table 6.5: Description of objectives and intended outcomes

Objectives/ intended outcomes	Description
Awareness raising/making the case	To bring about increased awareness of the abilities of and the opportunities for women to work in SET, and the barriers women face in attaining such access and participation
Increased access	To ensure quantitative increases in the number of women accessing SET knowledge, SET studies, and SET careers
Expanded participation	To increase the qualitative and quantitative nature of participation of women in SET
Increased probability for progression	To increase the probability of women progressing to more senior levels within SET by assisting them to enhance their skills and motivation, and to bring about the necessary structural adjustments alongside this process
Increased support	Emotional, physical and financial support to women studying and working in SET
Improved retention	To increase the number of women who will willingly continue to work in SET by addressing the main causes for exiting with a special focus on work-life balance, and differences in recognition and reward
Increased representation/gender equity	To ensure adequate female representation at various levels of SET participation
M&E of participation	To increase and enhance M&E systems capable of producing data and research findings on the participation of women in SET

Figure 6.9: Objectives of initiatives for women in SET

The following three objectives are of primary importance to the majority of initiatives namely: (1) increasing the support for women in various stages of their SET careers (76% of all initiatives); (2) expanding the participation of women in SET (69% of all initiatives); and (3) increasing gender equality in SET (67% of all initiatives). This is followed by increasing access for women to SET (56% of all initiatives); increasing the probability for progression in SET careers (57% of all initiatives); and continual awareness-raising of the potential for women in SET, the abilities of women already active in SET and the challenges they face (54%). For 48% of initiatives the objective of retaining women in SET is crucial and 26% of initiatives are concerned with establishing tools for the monitoring and evaluation of female participation in SET.

Table 6.6 provides examples (extracted from the Initiative Summaries – Appendix B) of the various types of intervention objectives and outcomes as they relate to the participation of women in SET.

Table 6.6: Examples of initiative objectives and outcomes

Overarching objective	Initiative	Stated objectives of initiative	Stated outcomes of initiative
Awareness raising/making the case	UK Expert Women 's database	This database was originally developed in 1997 as the first initiative of its kind in Europe to be used as a tool to raise awareness of the skills and knowledge of women in science, engineering and technology.	Increased awareness of the skills and knowledge of women in SET.
Increased access	FEMSA	FEMSA aims to promote the involvement of girls in science, mathematics and technology subjects at primary and secondary schools in Africa.	(1) Insight into the difficulties girls face in the study of SMT subjects in Cameroon, Ghana, Tanzania and Uganda (2) To sensitise relevant ministries of education and other key persons in education about the status of female participation in SMT and the importance of reforming SMT education to meet the needs of girls (3) To disseminate and share information and experiences on girls' education at national and regional levels.
Expanded participation	genSET	genSET improves individual and collective capacity for action to increase women's participation in science.	Increased individual and collective capacity for action to increase women's participation in science.

Increased probability for progression	SCWIST	The society's programmes aim to support, promote and build the capacity of women in SET. SCWIST's mission is to promote and empower women in science and technology. As such, SCWIST provides opportunities to women to put their talents to use or to develop new skills.	Increased capacity of women in SET; increased representation, retention and status of women in S&T.
Increased support	Mentorset	A mentoring scheme started in 2002 to help women working in SET. They provide independent mentors who understand the challenges faced and who can provide support and advice.	Support to women in SET through mentoring.
Improved retention	PICA	The Programme supports outstanding researchers returning to active research after either a prolonged absence, or those within the early consolidating stages of their independent research career.	Supports and retention of outstanding researchers returning to active research after either a prolonged absence, or those within the early consolidating stages of their independent research career.
Increased representation/equality	Swiss federal programme for gender equality in universities	The aim of the first programme period was to double the percentage of female full and associate professors at Swiss universities, from 7% in 1999 to 14% by 2006, and to increase the proportion of women at all stages of an academic career. Even though it seemed very ambitious in 1999, this aim has been met in 2006. Since, a new aim has been defined in connection with the current programme period, which is to reach 25% women professors by 2012.	Enhanced women's careers in academia and research and access to professorship.

M&E of participation	BASNET	To mobilise an international effort by establishing the interregional Baltic States Network “Women in Sciences and HT” among women working groups, professional organisations and corresponding departments of the governmental institutions. To monitor changes in the scientific society and dissemination of the information and good practices it is proposed: to establish the Baltic States Data Bases of Women in Sciences and HT; to create the monitoring and information systems on Women in sciences and HT.	BASNET is designed to mobilise the interregional and interdisciplinary efforts for supporting development of the strategy to increase equal participation of women scientists in different fields of professional activity and in the decisionmaking process on different levels of science policy and its management in the Baltic States.
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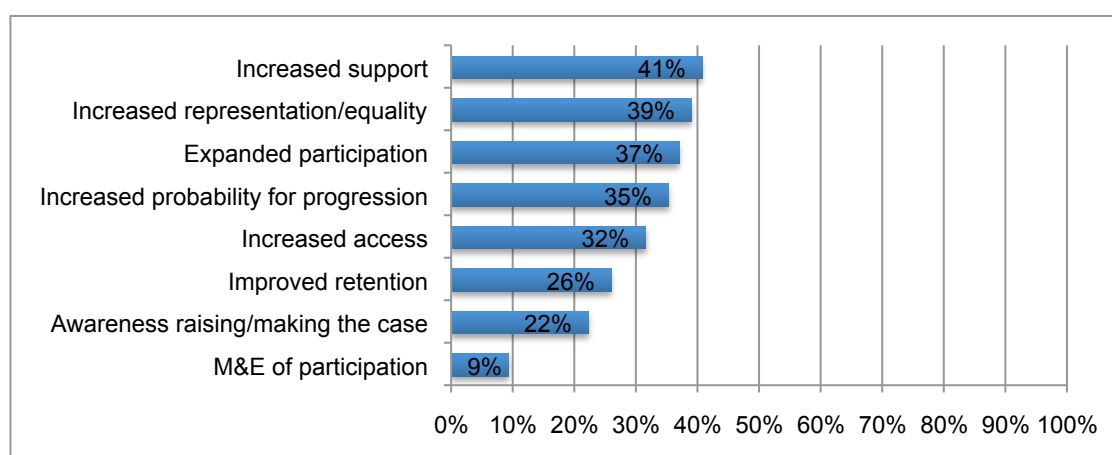
Level of intervention per objective of initiatives

When looking at the relationship between the level of intervention and the objectives of initiatives, *Table 6.7* shows that initiatives aimed at a national level of intervention are most concerned with the retention of women in SET (73%), as well as increasing the probability for progression in SET (67%) and in monitoring and evaluating the participation of women in SET (66%). When an institutional level of intervention is present, the primary goal is to increase the support for women working in SET (79%), to expand the participation of women in SET (71%), and to increase the representation or equality of women in SET (67%). *Kiriri Women’s University of Science and Technology* in Kenya is a prime example of such an institutional-level intervention. Their intended outcomes include: *Expanded opportunities for higher education, in the scientific and technological fields to women in Kenya and the rest of the world; and graduates with unique qualities for leadership and scientific enterprise, able to apply their knowledge to practical problems and issues in their societies.* At grassroots level, which is mostly representative of industry, the increased support for women in SET careers is of primary concern (72%) with the issues of increased access, expanded participation and increased representation also featuring strongly. Initiatives with an international reach are most concerned with awareness-raising (77%), followed by increased support and representation (65%), as well as increased access and expanded participation (62%) highlighted as important goals.

Table 6.7: Level of intervention per objective of initiatives for women in SET

	Implementation/ grass root		Institutional		National/policy		International	
Goal	N	%	N	%	N	%	N	%
Awareness-raising	18	62	22	38	22	26	20	77
Increased access	20	67	32	55	48	57	16	62
Expanded participation	20	67	41	71	49	58	16	62
Increased probability for progression	17	59	36	62	57	67	9	35
Increased support	21	72	46	79	49	58	17	65
Improved retention	16	55	27	47	62	73	7	27
Increased representation	18	62	40	67	42	49	17	65
M&E of participation	8	28	8	14	56	66	9	35

*Note= All percentages are calculated by dividing the number of initiatives that indicate a particular level of intervention focused on a particular goal, by the total number of initiatives that focus on the said level of intervention. Example: In total there are 29 initiatives that indicated a grass root level of implementation. Of these 18 indicated awareness-raising as a goal. 18 initiatives are then divided by the total of 29 possible initiatives indicating that 62% of all initiatives that have a grass root level of intervention have awareness-raising as one of their goals. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

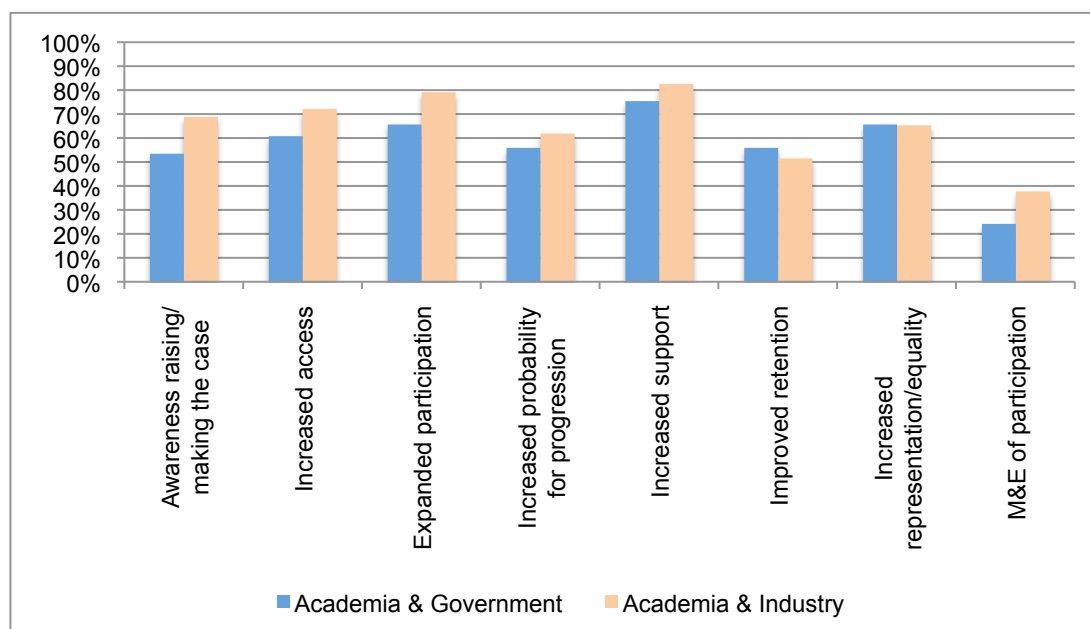
Figure 6.10: Objectives of initiatives for women in SET with national and institutional level of intervention


When reviewing the objectives of initiatives for women in SET and combining their national and institutional level of intervention, *Figure 6.10* indicates that the overarching objectives are the increased support of women in SET (41%); increased representation of women in SET (39%); the expanded participation (37%); and increased probability of progression (35%) of women in SET.

Drivers per objective of initiatives

Increased support and expanded participation are the primary objectives for initiatives jointly driven by academia and government, as well for those driven by academia and industry partnerships. Increased access and increased representation also feature strongly among both these types of initiative groupings. Awareness-raising and increased probability of progression are highlighted as set objectives more by academia and industry driven initiatives (69% and 62%) than by academia- and government-driven initiatives (54% and 56%).

Figure 6.11: Combination of drivers by goal of initiatives for women in SET



Target group per objective of initiatives

Table 6.8 summarises the relationship between the objectives of initiatives and the target group the initiative is primarily aimed at. The most common objective across the various target groups is increased support for women during the various stages of their SET careers, from being a student, to scientists just entering the field, to established women working in SET generally and in specific sectors of SET, and also women at senior levels. The objective of increased access features strongly in initiatives aimed at school girls and students, while expanding the general participation of women in SET features highly across the board. Besides increased support, initiatives targeting senior women working in SET are further focused on increasing the probability for progression (82%), improving retention (71%) and increasing representation or gender equality (71%) for senior women. Initiatives trying to address the needs of returners are, as can be suspected, most concerned with the issue of

retention, while initiatives targeting policy and decisionmakers are most concerned with gender equality in SET (85%), awareness-raising about the challenges women in SET face and the need for more female representation (72%).

Table 6.8: Target group per objective of initiatives for women in SET

	School girls	Students	Women in SET	Women in specific sector	Entry level scientist	Senior women in SET	Returns	Employers	Policy & decision makers
Awareness raising	58%*	47%	64%	46%	48%	50%	42%	69%	72%
Increased access	83%	80%	66%	52%	69%	50%	50%	44%	64%
Expanded participation	79%	84%	79%	74%	86%	65%	75%	75%	77%
Increased probability for progression	46%	62%	70%	67%	69%	82%	58%	56%	57%
Increased support	67%	84%	91%	87%	95%	88%	75%	81%	68%
Improved retention	46%	51%	62%	48%	55%	71%	100%	69%	51%
Increased representation	71%	71%	77%	65%	69%	71%	50%	75%	85%
M&E of participation	8%	11%	30%	15%	17%	18%	33%	56%	45%

*Note= All percentages are calculated by dividing the number of initiatives that indicate a particular target group focused on a particular objective, by the total number of initiatives that focus on the said target group. Example: In total there are 24 initiatives that indicated school girls as a target group. Of these 14 indicated awareness-raising as an objective. 14 initiatives are then divided by the total of 24 possible initiatives indicating that 58% of all initiatives that target school girls have awareness-raising as one of their objectives. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

6.2.6 Type of initiatives and core activities

'Type of initiative' makes references to the nature or main character of something - in other words, within the context of this study the type of initiative would speak to the focal character of the initiative – that by which it is distinguished. The most visible aspects of all reviewed initiatives are the core activities (the physical actions) implemented to achieve the set objectives. Typecasting an activity/action then also makes it possible to group similar 'types' together. *Table 6.9* gives an overview of the types of initiatives (and associated core activities and groupings) included in the study.

Table 6.9: Description of types of initiatives and associated core activities

Type of initiative	Description and associated core activities
National strategy/programme	Initiative characterised by national objectives and role players influencing the SET system from a top-down approach most often utilising policy and legislative reform to do so.
Information dissemination	Initiative characterised by information collection and dissemination activities most often for the purposes of profiling, awareness-raising, advocacy and lobbying.
Education & training	Initiative characterised by education and training activities most often aimed at skills development, career development, and enhanced human resource practices.
Networking & support	Initiative characterised by providing formal and/or informal opportunities for networking with peers and leaders within SET (including mentoring) most often with the purpose of sharing experiences and extending support.
Research	Initiative characterised by research and analysis activities.
Award scheme	Initiative characterised by providing public recognition and/or monetary reward for the abilities and achievements of women in SET, and for those who facilitate their participation in SET.
Association/grouping/coordinating body	Initiative characterised by bringing together and representing groups of people with similar concerns or primary functions within SET.
Other	Initiatives characterised by any other traits than those included in above-mentioned types.

With the above descriptions in mind, it is evident that many of the initiatives cannot clearly be linked to only one type (category). An example of this might be an initiative that contains the word ‘mentoring’ in its title and therefore could easily be classified as a networking and support type of initiative. On closer investigation such an initiative could also include education and training activities, an award scheme and might even be driven by a particular association or coordinating body. On the other hand, there are one-dimensional initiatives such as an award scheme that only selects candidates and disburses grants, bursaries and research awards. The bulk of initiatives are therefore classified under a number of ‘types of initiatives’. The analysis then refers to what types of activities are engaged in most frequently, rather than how many of a particular type of initiative is available for women in SET.

Table 6.10: Types of initiatives for women in SET

	N	%
National strategy/programme	43	35
Information dissemination	57	46
Education & training	45	37
Networking & support	80	65
Research	25	20

Award scheme	43	35
Association/grouping/coordinating body	48	39
Other	29	23

The most popular type of intervention for women in SET is networking and support (65% of all initiatives). Examples include:

- Portholes/gateways with websites and online support such as UK based Portia: The purpose of Portia is to provide a gateway into SET for women of all ages and backgrounds, as well as organisations and institutions, to improve participation of women in SET. There is a range of resource on the website including links to articles, reports and commentary of interest to women, jobs, careers and mentoring; courses and research; and conferences, workshops and meetings.
- Various higher education institutions have established internal networking and support structures such as mentoring programmes, such as *Women in Industry (WIN)*. This mentoring programme for young scientists from the University of Basel offers the opportunity to learn about job prospects and private sector opportunities. An experienced specialist from the university advises the mentee for a year. The programme, hosting 25 mentees and running for a period of 18 months, is available to doctoral and postdoctoral students and lecturers. Mentors and mentees made a common goal agreement and work from there. Workshops are also hosted throughout the programme period.

Networking and support is by far the most popular mode of intervention, followed by initiatives that are mainly identified by information dissemination (46% of all initiatives), such as the *Women in Engineering Programs & Advocates Network (WEPAN)* whose strategy focuses on the transformation of higher education institutions. By leverage its knowledge, experience, partnerships and advocacy expertise WEPAN aims to bring about institutional change at a national level. They focus on science, technology, engineering and mathematics-related disciplines. They are a resource centre and advocate for women working in these disciplines.

The third most popular type of initiative is those that represent a grouping of people with similar goals and needs such as associations and coordinating bodies (39% of all initiatives). Examples of these include the *Women's Engineering Society (WES)* in the UK, *Women in Technology and Science (WITS)* in Ireland, *Portuguese Association of Women Scientist (Amonet)* in Portugal, *Association for Women in Science (AWIS)* in the US, *Society for Canadian Women in Science and Technology (SCWIST)* in Canada, *Association of Women Engineers, Technicians and Scientists in Uganda (WETSU)*, *Association of SA Women in Science & Engineering* in South Africa, *Women in Engineering (WIE)* in Australia, and, internationally, the *Global Alliance for Diversifying the Science and Engineering Workforce*.

Level of intervention per type of initiative

When reviewing the level of intervention by type of initiative, *Table 6.11* shows that networking and support-type initiatives are the most common type of initiatives at the grassroots, institutional and national level of intervention. At an international level of intervention, the majority of interventions are of an information dissemination type. Information dissemination-type of initiative also features high among initiatives that intervene at grassroots level. Besides networking and support, education and training and funding and award-type initiatives are also found among more than 40% of initiatives that operate at institutional level. National strategies and programmes obviously are common among initiatives intervening at the national level and this is seemingly supported by information dissemination type initiatives.

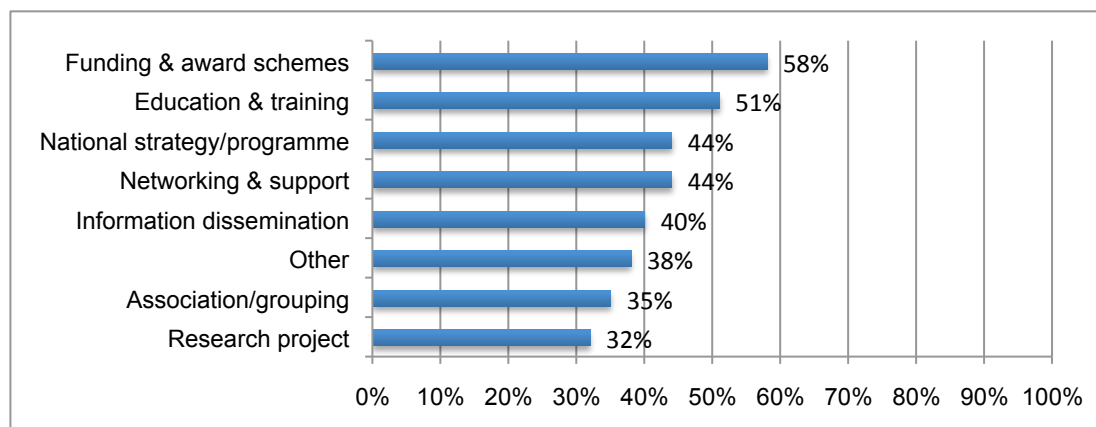
Table 6.11: Level of intervention by types of initiative for women in SET

	Grassroots	Institutional	National	International
National strategy/programme	24%	21%	45%	31%
Information dissemination	72%	29%	44%	58%
Education & training	48%	41%	33%	12%
Networking & support	76%	66%	55%	42%
Research project	21%	12%	24%	31%
Funding & award schemes	24%	41%	38%	8%
Association/groupings	52%	29%	37%	42%
Other	17%	21%	24%	19%

Sector specific focus per type of initiative

Figure 6.12 shows the percentage that each type of initiative focuses on a specific subsector.

Figure 6.12: Sector specific focus per type of initiative for women in SET



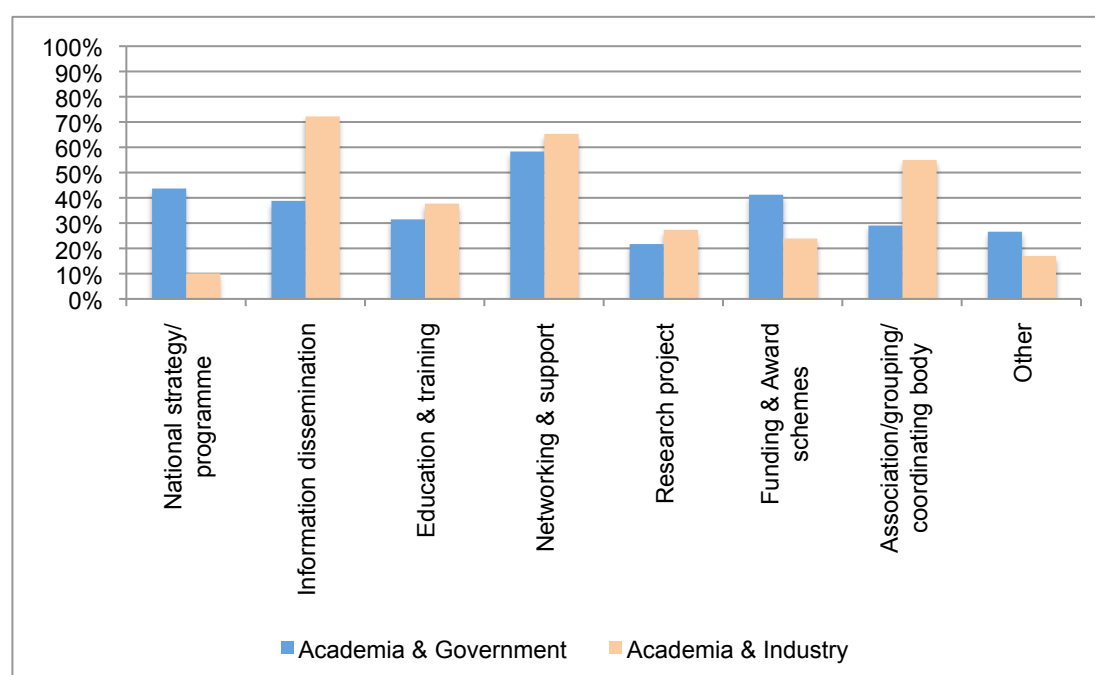
More than half of funding and award-type schemes are aimed at a specific subsector within SET, most notably higher education (such as *Aspasia*, *Swiss federal programme for gender equality in*

universities, *Le Mentorat* - Geneva University, Office of Women in Higher Education); engineering (such as *Women in Engineering Australia*, *Chairs on Women in Engineering in Universities*, *WEPAN*) and IT. Also half of all education and training type initiatives are focused on specific sectors within SET, with information dissemination, networking and support, and national strategy type initiatives targeting just more than 40% of specific subsectors of SET with their activities. Research project type initiatives, associations/groupings and coordinating bodies are more generically focused on the SET sector.

Drivers per type of initiative

Figure 6.13 illustrates that national strategies and programmes are most commonly jointly driven by academia and government (44%), with academia and industry as co-drivers and not being very involved in such initiatives (10%). Information dissemination projects and associations are more commonly driven by academia and industry, whereas funding and awards schemes/programmes are generally driven more by academia and government. Networking and support type initiatives are popular with academia, government and industry, irrespective of who their co-drivers are.

Figure 6.13: Combination of drivers by type of initiative for women in SET



Target group per type of initiative

National strategy or programme type initiatives mostly target policy and decisionmakers, with some focus on women working in SET (*Table 6.12*). Information dissemination type initiatives target both policy and decisionmakers and women working in SET, while education and training type initiatives are more focused on training students, policy and decisionmakers and women working in SET. Networking and support type initiatives offer these opportunities to students, entry-level scientists and women already working in SET. The majority of research type initiatives target policy- and

decisionmakers with some focus on women working in SET. Funding and award schemes target their rewards towards all women working in SET, with a slight preference for senior women in SET. Most associations/groupings and coordinating bodies target students and women already working in SET to join their groups.

Table 6.12: Target groups by type of initiative for women in SET

	National strategy	Information dissemination	Education & training	Networking & support	Research project	Funding & Award schemes	Association/groupings	Other
School girls	14%*	26%	27%	23%	20%	21%	21%	24%
Students	21%	39%	51%	44%	28%	44%	42%	38%
Women working in SET general	37%	49%	47%	48%	44%	49%	52%	38%
Women working in specific SET sector	30%	33%	42%	43%	28%	53%	27%	31%
Entry level young scientists	28%	32%	36%	41%	28%	53%	38%	34%
Senior women in SET	28%	23%	29%	34%	24%	56%	17%	48%
Returners	19%	11%	13%	9%	16%	14%	10%	3%
Employers	21%	14%	16%	14%	24%	19%	15%	17%
Policy and decision makers	56%	49%	51%	33%	68%	47%	38%	55%
Other	9%	9%	7%	5%	8%	5%	8%	17%

*Note= All percentages are calculated by dividing the number of initiatives by type of initiative that focus on a particular target group, by the total number of said type of initiative. Example: In total there are 43 initiatives that are classified as national strategies. Of these, six indicated targeting school girls as a particular target group. Six initiatives are then divided by the total of 43 possible initiatives indicating that 14% of all initiatives that fall under the type of 'national strategy' target school girls as one of their target groups. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

Objectives per type of initiative

Table 6.13 provides an overview of the main objectives being pursued by the various types of initiatives. National strategies for women in SET are the most focused on ensuring increased representation or gender equality for women in SET (77%). South African's own *Women in Research*

(W-I-R) is an example of this with an aim to *support women, especially black women, to develop and strengthen their research skills, and to increase the number of women in postgraduate studies, academia, research and in leadership positions at South African tertiary and research institutions*. National strategies or programmes are also concerned with expanding the participation of (74%) and increasing the access and support for women in SET (65%).

Awareness-raising around the situation of women in SET and the potential for altering this situation is an objective most associated with information dissemination- and research-type initiatives. A prime example is GENDERA, which is a consortium that consists of nine partners from nine European countries namely Austria, Germany, Greece, Hungary, Israel, Italy, Slovakia, Slovenia and Spain. The website states that: *From 2010 – 2012, the Partners in the GENDERA initiative will strive to make a change to the balance of gender in research organisations in Europe. By raising awareness in a wide cross-section of today's society, GENDERA aims to re-address the balance of gender within research organisations and higher education organisations across Europe. The role of women in specific disciplines and in decision-making positions will be strengthened through dialogue (the gender debate) and the implementation of best practices. From 2010 onwards, the GENDERA partners will collect, systemise and analyse existing policies and programmes in order to identify good practices that are already having a positive effect on ensuring that women get hired in research organisations and higher education institutions and achieve decision-making positions.*

Funding and award schemes are the type of initiatives that are most concerned with the issue of progression, with networking and support type initiatives following suite. Examples include *Aspasia* in the Netherlands, the *Swiss National Research Council and VINNMER Fellows* in Sweden, *Le Mentorat at Geneva University* in Switzerland, the *Women Scientists Scheme (WOS)* in India, the *Presidential Awards for Excellence in Science, Mathematics, and Engineering (PAESMEM)* in the US; *Thuthuka Programme* in South Africa and *UNESCO's Chairs Women in Science Technology and Development*.

Increased support for women through the various phases of a SET career is a crucial objective for almost all types of initiatives, with the goals of increased access, improved retention and increased representation receiving somewhat less attention. As can be expected the goal of monitoring and evaluating the participation of women in SET is most prevalent in research type initiatives. The UK's *Women Returners Study* models this type of initiative. The research aimed to *investigate the ways in which the UK can maximise the return on investment made in training graduates in SET and address projected skills shortages. The research project was designed to (1) quantify the number of people with degree level qualifications in SET; (2) identify how many are not currently working in SET occupations and the activities they are employed in; (3) investigate how, if at all, they could be attracted back into SET occupations; (4) identify how employers could support those returning to the sector and how more might be encouraged to utilise returners; and (5) identify existing schemes and whether these meet the needs of employers and returners.*

Table 6.13: Objectives by type of initiative for women in SET

	<i>National strategy</i>	<i>Information dissemination</i>	<i>Education & training</i>	<i>Networking & support</i>	<i>Research project</i>	<i>Funding & Award</i>	<i>Association/ Groupings</i>	<i>Other</i>
Awareness raising	47%*	82%	56%	56%	80%	51%	69%	66%
Increased access	65%	60%	71%	56%	64%	67%	60%	48%
Expanded participation	74%	72%	82%	78%	72%	91%	83%	59%
Increased probability for progression	53%	56%	69%	73%	68%	84%	60%	45%
Increased support	65%	79%	78%	93%	72%	98%	90%	69%
Improved retention	47%	51%	51%	58%	56%	67%	54%	45%
Increased representation	77%	68%	78%	71%	76%	81%	77%	66%
M&E of participation	28%	40%	24%	26%	68%	21%	42%	14%

*Note= All percentages are calculated by dividing the number of initiatives by type of initiative that focus on a particular objective, by the total number of said type of initiative. Example: In total there are 43 initiatives that are classified as national strategies. Of these 20 indicated awareness-raising as a particular objective. 20 initiatives are then divided by the total of 43 possible initiatives indicating that 47% of all initiatives that fall under the type of 'national strategy' have awareness-raising as one of their primary objectives. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

6.3 ADDRESSING THE CAUSES

Although not directly stated by the various initiatives, an attempt was made to identify the specific main causes for the relative unequal participation of women in SET that these initiatives are trying to address. The majority of the initiatives are focused on addressing the unequal access for women to SET (63%), followed by attaining the recognition and reward women in SET deserve (46%), addressing the male-dominated nature of science (38%), assisting women in SET to maintain a healthy work-life balance (29%), and finally with increasing the representation of women in leadership positions within SET (26%).

This confirms what the literature is indicating, that much effort is being made and some success is being had in terms of ensuring increased access for and recognition of the potential of women in SET, but that assisting women in SET in achieving a healthy work-life balance and increasing female representation in SET leadership still requires more attention.

The literature also confirms the issues around access. Although there has been much effort and success in assuring increased access for women wishing to study in SET, both on bachelors and doctoral level, the focus is shifting towards ensuring access to the SET workforce and addressing the male-dominated nature of science that might prevent women from actually continuing their pursuit of a SET career. Regarding the recognition and reward of women in SET, the focus is on the general

profiling of the success and possibilities for women in SET. This is supported by funding and award schemes specifically recognising the accomplishments of women in SET and thus increasing their status and access to funding.

Table 6.14: Initiative focus on addressing main causes for the unequal participation of women in SET

	N	%
Unequal Access	77	63
General access	61	50
School level access to SET	8	7
Access to studying SET at tertiary level	33	27
PhD access	28	23
Access to SET workforce	65	53
Male-dominated nature of science	47	38
Work-life balance	36	29
Differences in recognition/reward	57	46
General recognition and reward	49	40
Access to funding	28	23
Addressing equal remuneration	5	4
Non-financial recognition and awards	26	21
Lack of female representation in leadership	32	26

Examples of initiatives addressing the main causes of for the relative unequal participation of women in SET

The following section summarises extracts from the initiatives summary database (*Appendix B*) as an illustration of interventions targeting specific barriers in the pursuit of equal participation of women in SET.

Unequal Access

General access to SET
Center for Gender Equality (University of Vienna)
The Center for Gender Equality is a service center at the University of Vienna. We coordinate and offer various measures aiming at gender equality and the promotion of women in academia. While offering measures for academic and administrative staff as well as students, we particularly focus on developing and implementing projects and initiatives which support and advance women's careers as academics and scientists and which enhance gender equality as a guiding principle of university culture.
School level access to SET
Science Clinics (Ghana)
In 1987, only one in 11 children at secondary school in Ghana was a girl - a figure that finally encouraged the country's government to do something about the educational gender imbalance endemic to many African countries. That year saw the inauguration of a new kind

of "summer school" - the Science and Maths Education Clinic. One hundred and 10 female students enrolled in the first year. The ratio is down to one girl to three boys taking science and maths at secondary level.

Access to studying SET at tertiary level

Committee for Gender Balance in Research (Norway)

The Committee will support and provide recommendations on measures that can contribute to the mainstreaming of the gender equality efforts at the institutions within the university and college sector as well as the research institute sector. The Committee may also contribute to an overall awareness rising around issues connected to the skewed gender balance in academia and the research sector.

PhD access

Thuthuka Programme (SA)

The Thuthuka Programme's role can be seen as: Building of individual capacity of women, blacks and individuals from disadvantaged institutions. This will contribute directly to the skills and competencies needed for S&T development. Building the pool of post-graduates in order to supply the needs of the academic labour market. The strategic objectives of the programme include: Improvement of the qualifications of the designated research group to doctoral and postdoctoral levels.

Access to SET workforce

Korean National Institute for Supporting Women in Science and Technology (ISWIST)

The center is tasked with carrying out research in policy development; educating, training, and consulting with women in S&T; providing information on employment; and supporting organisations of women scientists and engineers. ISWIST's mission is to foster women professionals in science and technology from the start of their employment to their becoming leaders in the S&T workplace.

Male-dominated nature of science

Women in Science Equity Network (WISNET) (Australia)

To explore programs for change in the sciences and more democratic and participatory systems as an alternative to the male-dominated tradition.

Tension of reconciling professional and private life

CareerWISE (Arizona State University)

The CareerWISE online psychological education program develops skills for addressing personal and interpersonal challenges in science and engineering environments and for strengthening personal assets and supports. The site is built on an extensive foundation of theory and research on psychological processes, environmental context, and personal behaviors that contribute to women's experiences in academic and career paths. The two

primary purposes of the site are to help women in STEM programs find ways to better manage their immediate environments (an intervention model) and to provide a long term resource to all women for overcoming barriers and for expanding personal supports in their future career environments.

Differences in recognition and reward

General recognition and reward

PROMETEA (Europe)

The aim of PROMETEA is to develop a better understanding of gender issues in engineering and technology research settings, in order to propose effective measures and recommendations to empower women engineers careers in academic and industrial research in Europe. Goals include: To explore the assessment and measures of excellence in engineering and technology research and the impact on male and female careers; To compare different arenas of recognizing excellence; To compare actors who assess and evaluate excellence; To compare success rates in research funding and awards; To compare salaries, bonuses and research budgets.

Access to funding

Principal Investigator Career Advancement (PICA) Programme (Ireland)

PICA supports outstanding researchers returning to active research after either a prolonged absence, or those within the early consolidating stages of their independent research career. The SFI Principal Investigator (PI) Programme supports those fields of science and engineering that underpin biotechnology, information and communications technology, and sustainable energy and energy-efficient technologies. PI grants may range from €100,000 to €500,000 direct costs per year and may be 3-5 years in duration.

Addressing equal remuneration

Association for Women in Science (AWIS) (US)

We envision a day when women will participate fully in science, technology, engineering, and mathematics as manifested through equal opportunity, pay equity, and recognition commensurate with their accomplishments.

Non-financial recognition and awards

Royal Society's Annual Rosalind Franklin Awards (UK)

The Award goes to an individual, most likely in mid-career, who has made an outstanding contribution to any area of natural science, technology or engineering. If the winner is a woman, she will be seen as a role model for young girls and women scientists and if the winner is a man, he will enable the key messages of gender mainstreaming to be communicated widely in SET.

Lack of female representation in leadership**FAWESA Professional Development Programme (SA)**

The Forum for African Women Educationalist South Africa (FAWESA) is a South African Chapter of the Forum for African Women Educationalist (FAWE), a partnership of African women cabinet ministers, vice-chancellors of universities, and other senior women policy makers, who assume leadership for education planning and implementation in their countries. FAWESA was formally launched in March 1997 with the primary objective of bringing together female educationalists, policy-makers, researchers, and practitioners to provide gender equity in education and training through addressing policy-making and implementation in education at all levels. One of FAWESA's objectives include: To promote women's leadership and public policy-making skills within education through targeted capacity-building programmes.

Table 6.14 displays the type of initiatives most commonly associated with identifying causes for unequal SET participation. The most common type of intervention used to address all the main causes for the unequal participation of women in SET is networking and support.

Besides networking and support, the most popular types of interventions used to address the issue of access are education and training, information dissemination and national strategies and programmes. Activities associated with these types of interventions include awareness-raising and profiling activities, information collection and dissemination on the issue of female access in SET, and career and human resource development activities.

The challenge of assisting women in SET to cope with, and in certain instances reform, the male-dominated nature of science is most commonly associated with networking and support, information dissemination and organised structures such as associations, coordinating bodies and groupings of women and /or men focused on this challenge.

Women in SET are assisted to face the challenge of achieving a more realistic work-life balance by taking part in initiatives that offer networking opportunities with other women in the same position who can potentially share their experiences. Funding and award schemes are also used as a type of intervention to address the challenge of achieving a work-life balance for women in SET. Possibly by providing funding opportunities that take cognisance of their personal lives and allow for a break in their studies or that subsidise certain personal expenses that could distract the female student or scientist from the task at hand. One of the main activities utilised by these type of interventions are career and HR development activities aimed at training female scientists to cope with the demands of work and domestic responsibilities and providing guidance to institutions on how they can make it easier for women to achieve this balance with the implementation of good employment practices. This is done in conjunction with information collection and dissemination and awareness-raising about the challenge of work-life balance for women in SET. Financial assistance is also utilised to address the

practical challenges faced by women trying to build a career; these can include maternity leave and childcare.

The challenge of recognition and reward is mostly addressed by funding and award schemes that profile and acknowledge the contribution women are making to SET. Funding and award schemes are also used by 66% of initiatives aimed at addressing the challenge of placing more women in senior and governing positions within SET. These award schemes are not just used to reward female scientists progressing in SET, but also to encourage institutions to put measures in place to overcome this challenge. The activities most frequently associated with these types of interventions are career and HR development activities that train and assist potential female leaders in SET in professional and leadership skills. They also assist institutions in implementing HR practices that will support the emergence of more female leaders. Awareness-raising is an activity also used by more than half of these initiatives in an effort to make all role players aware of the lack of female decisionmakers in SET and also to make women aware that this gap can and should be filled by them. Various support and networking activities are also used to bring female leaders in SET together to share their experiences, best practices and to offer support and encouragement to each other.

Table 6.15: Type of intervention by challenge initiatives for women in SET aim to address

	<i>Unequal access</i>	<i>Male-dominated nature of science</i>	<i>Work-life balance</i>	<i>Differences in recognition & reward</i>	<i>Lack of female representation in leadership</i>
National strategy/programme	40%*	28%	39%	40%	38%
Information dissemination	42%	45%	42%	42%	34%
Education & training	44%	30%	39%	33%	38%
Networking & support	58%	70%	78%	58%	75%
Research project	22%	13%	25%	23%	28%
Funding and award scheme	36%	32%	50%	58%	66%
Association/grouping/Coordinating body	35%	43%	33%	32%	38%
Other	19%	23%	17%	26%	22%

*Note= All percentages are calculated by dividing the number of initiatives that indicate addressing a particular challenge and are of a particular type, by the total number of initiatives focused on said challenge. Example: In total there are 77 initiatives that indicate addressing unequal access as a particular challenge. Of these 31 are classified as national strategies or programmes. 31 initiatives are then divided by the total of 77 possible initiatives indicating that 40% of all initiatives that are focused on addressing the challenge of unequal access fall under the type 'national strategy/programme'. These calculations deviate somewhat from the standard practice for the construction of cross-tabulations but is necessary to accommodate the current structure of the initiatives database.

6.4 MAIN FINDINGS AND CONCLUSIONS

In summary, the chapter concludes by trying to answer the second research question posed in this study: What is being done to increase and facilitate the participation of women in science? This is

done by trying to answer the following related thematic questions: (1) who is driving the process, (2) for whom, (3) with what focus in mind, (4) by what means; and (5) to what end?

Who is driving the process?

The fact that the majority of initiatives are aimed at bringing about change at a national/policy level is consistent with the findings of *Chapter 4*. This is the level of interaction that has been most influential in addressing the participation of women in SET worldwide and is the preferred starting point to bring about long-term transformation. Government and academia are also the strongest drivers of these initiatives as they employ the majority of researchers (especially in the higher education sector). Academia are in a unique position where they are obliged to roll-out government policies on the one hand, but also need to feed the human resource needs of industry on the other hand and therefore play an important middleman role. As a middleman and partner, they also have the power to influence policy and practice simultaneously. About 20% of initiatives have both a national and institutional focus indicating a possible trickle-down effect – with government designing and enforcing policy changes around the participation of women in SET and the tertiary institutions (academia) assisting them in driving the implementation. On the other hand, various initiatives are generated within institutions to specifically address the need of students and the workforce that will facilitate not only the increase in the participation of women in SET but also the ease with which this takes place. The data leaves one with a sense that both government and academia as leaders have done well in driving initiatives that increase the participation of women in SET, but that once they leave the ‘student’ phase and become part of the active workforce industry needs to be doing more to drive the facilitation of the participation.

For whom?

When looking at target groups across all the initiatives the focus is fairly evenly spread across school girls, students, women generally working in SET, women working in a specific subsector of SET, entry-level young scientists, senior women in SET, and policy and decisionmakers. This could point to a positive trend – in that initiatives aim to address the participation of women in SET throughout the pipeline of a SET career – and speaks to the holistic approach proposed in *Chapter 5* suggesting that by involving a number of role players the likelihood of long-term change is increased. This is borne out by the finding that more than half of all national and institutional level interventions target policy- and decisionmakers and women working in SET equally. Female students and entry-level scientists as well as senior women in SET are also receiving increasing attention from such interventions.

To the other extreme, this could also speak to a lack of focus and a spread of resources that could be better utilised if initiatives were aimed at a specific target group for a specific period. Most worrying is the limited focus on returners and employers by any of the initiatives. As both *Chapters 2* and *4* highlighted, returners are a significant part of the potential SET female workforce and until measures are put in place to accommodate their return to SET, valuable resources will keep on exiting the sector. This finding is however not surprising as both these target groups are closely linked to the

challenge of work-life balance and all sectors, but particularly industry, have been slow in responding to this particular reality.

With what focus in mind?

The majority of initiatives stated an objective of increasing the support for women in various stages of their SET careers. This could possibly be related to (1) the acknowledgment that women face a variety of challenges throughout their involvement with SET and every stage requires both tangible and emotional support, and (2) a shift in focus from access of women to SET to supporting and retaining them. This fits well with the next most popular objective of expanding the participation of women in SET; which speaks not only to the quantitative but also qualitative nature of participation. The objective of increasing the gender equality in SET indicated that more women are needed and they are needed at all levels of SET. Both these ideas are also further supported by the fact that half of all initiatives also focus their energy on increasing the probability for progression in SET careers, and the continual awareness-raising of the potential for women to enter SET as well as the abilities of and the challenges for women already active in SET.

More than 50% of initiatives do still however also focus their efforts on increasing the access for women to SET and, as the literature indicated, this is indeed still a reality in many countries where women do not have equal access to SET knowledge, SET studies and SET careers. This is corroborated by the finding that the objective of increased access features strongly in initiatives aimed at school girls and students.

Retaining women in SET and monitoring and evaluation of female participation in SET is of lesser concern for initiatives. Only initiatives operating at a national level of intervention are most concerned with the retention of women in SET and in monitoring and evaluating the participation of women in SET. The most probable reason for this being that the government operating at a national level has the greatest need to monitor the SET workforce for policy and planning purposes and, as they often have this information at hand, also realise the long-term impact of not retaining women in SET.

By what means?

The most common type of intervention for addressing the participation of women in SET is networking and support. These initiatives are characterised by providing formal and/or informal opportunities for networking with peers and leaders within SET (including mentoring) most often with the purpose of sharing experiences and extending support. This fits well with the most popular objective of increasing the support for women through the various stages of a SET career. These types of initiatives might be popular for a number of reasons such as:

- The realisation that to survive in the male-dominated nature of science requires informal instruction from men who know 'what it takes' to succeed in SET and from women who have already succeeded and can guide newcomers in the process.

- Groups of women realising that it is easier to continue in SET if one can share experiences and challenges and support each other in finding practical solutions.
- This is a fairly easy and inexpensive way of bringing together a number of role players operating at various levels capable of implementing the required change and monitoring progress.
- This also might point to the trend that more focus is being placed on facilitation rather than on access and that the challenges that are less quantitative in nature are starting to receive more attention (such as reconciling professional and private life, the male-dominated nature of science, and to a lesser degree guidance on how to ensure one is recognised, rewarded and promoted by one's peers and leaders).

Information dissemination and associations/groupings/coordinating bodies are closely related to the above and it is not surprising that they are also popular types of interventions. These types of initiatives have huge reach in terms of the number of people they can potentially influence, including the policy and decisionmakers, SET workforce and general public. Associations are also popular as they can target the unique needs and challenges of particular subsectors within SET.

It is not surprising that education and training, and funding- and award-type initiatives are most popular at institutional level as this is closely related to the nature of research and tertiary institutions – to train students and staff to become as proficient as possible and to increase their probability of progressing within their careers. Funding and award schemes also directly address the challenge of differences in recognition and reward.

To what end?

Very few initiatives are explicit regarding their attempt to address the causes for the relative unequal participation of women in SET. From those that did make some reference to these causes, the majority are focused on addressing the unequal access for women to SET; followed by attaining the recognition and reward women in SET deserve; addressing the male-dominated nature of science; assisting women in SET to maintain a healthy work-life balance; and finally with increasing the representation of women in leadership positions within SET. This corroborates with the data of both *Chapters 2 and 4* that the bulk of initiatives was originally focused on increasing the access of women to SET and have attained this to a large degree. This has been accomplished mainly through the use of education and training, information dissemination and overarching national strategies and programmes.

More recently the shift has been towards equal recognition and reward and great strides are being made. This is being achieved primarily through profiling the success of women working in SET and funding and award schemes honouring and financially rewarding promising students and established researchers.

The challenge of attaining a healthy work-life balance is, however, still only being addressed by more informal structures and on institutional levels where peers and employers offer guidance and support regarding balancing work and domestic responsibilities. A few funding schemes are also assisting women by offering them financial support when they have to attend to domestic responsibilities for a period of time or on re-entry to the SET sector after such a break. More needs to be done from a policy level to assist female employees and employers in this.

The lack of female representation in SET leadership has also been well documented but to date very few initiatives focus on this outcome specifically. The most obvious reason for this is that the primary focus has been on ensuring access for women to SET. Being a leader in any field is the pinnacle of a professional career and therefore one can assume that if the other challenges are not first adequately addressed this level of equal access will not be easy to attain. For instance, if the male-dominated nature of science is not adequately addressed it will remain a struggle for competent female scientists to prove themselves capable of competing with and even leading their male peers. If a female scientist does not feel that she has the right and the resources to be both a scientist and a partner/caretaker/parent without her professional or family life having to suffer, how can she focus on issues of leading others and making critical decisions? If female scientists are not equally recognised and rewarded for their skills and accomplishments why will they keep on competing and ever believe that they can reach the highest level of success and influence? To date funding and award schemes seem to be the most active type of initiatives in addressing this particular challenge. These types of schemes do not only reward female scientists for progressing in SET, but also acknowledge institutions and employers that are assisting female scientists to climb the career ladder. This is most commonly done by training female employees in professional and leadership skills and by assisting employers in designing and implementing HR practices that will develop potential leaders. A number of female leaders have also started forming coordinating bodies/networks for the purpose of supporting each other, sharing experiences and grooming the female leaders of the future.

The challenge of assisting women in SET to function effectively and progress within the male-dominated environment of science is not so tangible and not widely reported on in terms of intervention. Initiatives that indicate some focus on this particular issue reported using mostly networking and support, information dissemination and organised structures such as associations, coordinating bodies and groupings of women and/or men to challenge the status quo.

As a last thought, it is worth considering that although this particular study does not allow for a further investigation into particular subsectors of SET it would be interesting to see if there is a variance in outcomes for interventions focused on SET in general and those focused on particular subsectors. The fact that 45% of initiatives are indeed designed with a particular grouping in mind indicates that there most possibly is a need for such focused intervention, and also to the fact that some subsectors have been more aggressive in addressing the participation of women within their particular field.

In terms of impact not much can be concluded regarding the effectiveness of these initiatives to bring about a shift in the participation of women in SET as only 26% have undergone some form of evaluation. If one looks at the statistics reported on in *Chapter 2* it would seem that such a shift is taking place, but a more thorough evaluation of exactly how, where and why this shift is taking place would be valuable.

CHAPTER 7**CONCLUSION AND RECOMMENDATIONS****7. 1 SUMMARY OF MAIN FINDINGS AND CONTRIBUTIONS**

Our review of the literature has shown that women and men do not participate in SET on equal grounds – not quantitatively (access to participate) or qualitatively (ease of participation) (Fox Keller (1992), Etzkowitz et al (2000), EC (2003a), Brouns & Addis (2004)). Using the pipeline theory and the life-cycle approach as the theoretical bases of the study the main research questions that were formulated to drive this study were (1) *what causes the relative unequal participation of women in SET?*, and (2) *what initiatives are in place to increase and facilitate the participation of women in SET?*. The notion of “unequal participation of women in SET” was unpacked as referring to the unequal access of women to scientific resources, the male-dominated nature of science, tension of reconciling professional and private life, differences in recognition and reward, and the lack of female representation in leadership. The study also aimed to determine what progress is being made in addressing these challenges; and where the focus of such interventions are and hence need to shift to in future?

Unequal access to SET

Many of the early interventions were focused on convincing governments, institutions and communities about the value women can add to SET; about their ability to do so; and about the real lack of access to and participation of women in SET (EC (2003a, 2009a), NSF (2010, 2011)). The first level of access refers to access to scientific information as measured by the access young girls have to primary education and science subjects. The second level focuses on access to higher education and is measured in terms of female proportions in overall enrolment and graduation figures, PhD graduates; and SET enrolment and graduations figures at first and postgraduate degree levels.

In order to start this debate and to measure the progress being made in ensuring equal access to SET the importance of keeping, distributing and discussing sex-disaggregated data at all levels was and still is the critical starting point. Consequently, there are examples such as the EU and US with national structures that can provide such figures on a regular and reliable basis. A further consequence has been that sex-disaggregated data has exposed countries such as Austria, Germany, Switzerland, Netherlands and Belgium as low performers in assuring gender equality in SET and as a result they have subsequently started putting measures in place to address this. Sex-disaggregated data not only exposes the levels of access and participation, but also at which critical points in the pipeline participation is lacking.

As far as access to scientific information is concerned, the study provides numerous examples of how from an early age our thinking around gender and science is moulded by our culture and exposure, and how - to a large extent - this determines a girl's motivation to pursue science subjects at school, which in turn paves the way for further studies and a potential career in SET ((Gupta et al (2004),

Haataja et al (2006), Etzkowitz & Kemelgor (2001)). Worldwide a strong correlation has been found between a country's democratic nature, gender liberal viewpoints, presence of gender equality legislation and the level of female participation in SET. The literature then also confirms that for less democratic and progressive countries the starting point in terms of access will have to be at school and even pre-school. For these countries, the mind-sets about women in science first have to be addressed and then girls will have to be exposed to and be allowed access to science subjects at school level (EC (2003a, 2009a), NSF (2010, 2011)).

Currently Finland, Norway, Sweden, Denmark and Iceland are seen to be the leaders in promoting and monitoring gender equality in SET. For countries such as these and others following suit the results have been a rapid increase in the portion of female graduates in almost all fields with women even overtaking male students in some fields. Even at the level of post-graduate studies women are increasingly gaining momentum and also in certain fields overtaking their male counterparts. At higher education level, the biggest challenge is still found at doctoral and post-doctoral level. In South Africa, female SET enrolments are almost equal to those of male students, but women still lag behind slightly in graduations and especially so at post-graduate and doctoral level. However, these numbers are increasing annually. The biggest concern in the South African context is the limited number of black doctoral graduates and within this group, the absence of female representation.

Male-dominated nature of science

The male-dominated nature of science was presented from a quantitative (composition of SET workforce) and qualitative (ease of participation) perspective. In terms of composition of the SET workforce, the sex-disaggregated figures differ across countries but generally seem to indicate an increase in female representation. Currently more than half of all SET employees across Europe are female. However, the majority of these women are over-qualified for the positions they are in, thus pointing to the possibility that the challenge has shifted to one of progression rather than access. As Europe has been leading the way in laying the foundation for equal participation for women in SET, an interesting trend around the age distribution of women working in SET seems to be emerging as a possible indication of how the focus in terms of intervention can shift. The majority of female scientists in the south of Europe are aged between 25 and 34 years of age, compared to the north of Europe where the majority of female scientists are between the ages of 45 and 64. Countries in the south have been lagging behind in addressing gender equality in SET and have only more recently been aggressively promoting the potential participation of women in SET. The focus has seemingly been on improving access and particularly so on increasing the number of female SET graduates. The result has been that more women are actively pursuing doctoral and post-doctoral studies and then move on to starting their SET careers (Meri, 2008).

The northern countries have however been more progressive in achieving gender equality in SET and have already achieved the majority of gender targets in terms of access at higher education level. Therefore, their focus has shifted towards facilitating participation and retention of these older and

more experienced women in SET (Meri, 2008). Unfortunately, comparative figures are not available for other regions and countries. In South Africa the proportion of female representation in the SET workforce is increasing although very slowly and currently stands at almost 40%.

Although more women are entering and actively taking part in SET the manner (or ease) with which they participate is still challenged by the male-dominated nature of science. The male-dominated nature of science speaks to the masculine nature of science, requiring certain qualities of scientists to compete and progress in SET. Furthermore, it speaks to the tendency in this domain for the scientific agenda setting and the measurement of success being determined predominantly by men. Concepts such as male bonus, triple burden and direct and indirect gender bias were also highlighted to describe this environment, which most often leaves female scientists feeling unsupported and excluded (Etzkowitz et al (2000), Brouns & Addis (2004), Gupta et al (2004)). The literature leaves us with the impression that women are coping with the male-dominated nature of science by (1) either adapting to their environment by taking on the male characteristics valued and rewarded by the system; or (2) by moving on to others sectors that are more willing to embrace and accommodate their female nature.

Systemic change driven by government and institutes has seemingly been the most effective tool in bringing about the slow but very necessary transformation (Bonder (2000), Haataja et al (2006), Moletsane (2008), EC (2008, 2010b)). The available South African literature does seem to indicate that the SET field in SA is making strides in this particular area with the majority of women reporting feeling very comfortable working alongside their male colleagues in SET (NACI, 2008). Once again, as is the case with access, the age of female scientists and respondents seem to indicate that gender equality might be improving in the SET field, with more than 70% of women aged between 20 and 24 reporting that their employers consider their gender when determining their working conditions. The same study found that the older the female respondent the more negative she would be in her opinion regarding the obstacles she faces as a woman in the SET workplace. Racial discrimination is however still a huge hurdle in the SA context and the most marginalized group in SET is black women, who often having to achieve certain targets and positions without receiving the necessary training, tools or recognition.

Tension of reconciling professional and private life

Numerous studies (Cole & Zuckerman (1987), Lane (1999), Etzkowitz & Kemelkor (2001), Noordenbos (2002), Haataja et al (2006), Bradley (2007), NSF (2011)) have been done trying to determine the relationship between women as professional scientists and as partners and parents and what the effect of this balancing act might have on women's scientific career development. The majority of studies do seem to indicate that there is a continual tension between the priorities of work and family and that this eventually might lead to lesser participation by women in SET either temporarily or permanently. Some contrary findings have also emerged, but the one finding that clearly stands out in all studies is that successfully managing this reconciliation process requires additional resources and support. The latest tendency is for young women to want to still 'have it all'

but sequentially rather than concurrently. They want to work at building a successful SET career but feel there comes a time when maternity and parenting should take preference and for this period of time they step back from the formal working environment but wanting to return in due course (Bradley, 2007). The current reality is that very few institutions make provision for this type of 'returner' approach but might be wise to invest more thought and resources into this model. Institutions that have started putting measures in place such as family-friendly policies, flexi-time and childcare facilities are seeing the positive results of their actions (EC, 2003b).

Differences in recognition and reward

The dominant view is that women and men working in SET are not equally recognised and rewarded for equal abilities or quality of work (EC (2003a), Irving (2008)). This is evident from the variation in the gender's abilities to access funding for further research (research funding success rate), the right to earn equal pay for equal work (salaries), possibilities for promotion, and being awarded prestigious fellowships and grants.

If the aim were to increase the participation of women in science, logic would dictate that more funding be made available for women to pursue further studies and research in SET. This does seem to be the case for Europe with the literature indicating no vast gender imbalances in the success rates in applying for research funding. This picture is attributed to their national policies on gender balance targets, legislation on gender quota, and policies on university funding based on gender equity performance. Some worrying trends that do however emerge for the EU, US and Australia is the tendency of female scientists to apply for less funding than male researchers, to be less likely to re-apply for funding, to apply for smaller amounts and to apply to less prominent funds and for shorter periods (EC, 2009c). In South Africa, the share of funding for female researchers has also increased over the past ten years, but on average they still receive less funding than male recipients and the actual amount of funding has decreased (DST, 2009a).

Although the data on salaries for women in SET are limited, the available figures indicate that women in research are paid less than their male counterparts across positions, sectors and borders - even in countries that have legislation enforcing equal remuneration (Löfström, 2009).

Awards serve the function of motivating female scientists in establishing themselves among their peers and in establishing these women as role models and mentors for younger girls and women entering the system. Unfortunately, women are less likely to be the recipients of scientific rewards and fellowships and in most instances when they do receive such recognition it comes at a later stage of their careers with considerable less impact. The rating of a researcher is another form of recognising and rewarding his or her contribution to science and throughout the world, the majority of rated scientists are male.

Lack of female representation in leadership

Not only does SET need more female participation, it also requires more female representation in key positions within SET. Increased numbers of female scientists in key governance positions increases the potential impact women can have at policy and decision-making level in determining the SET research agenda, in the allocation of resources and in paving the way for other women entering or working within SET.

The number of women in senior science positions does seem to be increasing but at a very slow rate in all parts of the world, including South Africa (Bailey et al (2004), Commission of the European Communities (2005), NACI (2008), DST (2009a), EC (2009c) Molebatsi (2009), Husu & Koskinen (2010)). The lack of female representation at this level is evident in the limited number of women that are members of academies of sciences, directors of scientific boards, members of publication boards of academic journals; directors of research councils; and members of selection committees and peer reviewers and referees. Another worrying trend frequently mentioned in the literature is the apparent informal and non-transparent manner in which such positions are filled. The literature does however also caution against placing women in such positions in order to fill gender quotas without addressing the male-orientated system as a whole. This potentially could result in the strengthening of a system that would be increasing the class division between women - with these highly placed women no longer criticising the system that oppresses their female colleagues at lower levels but just 'playing along with the hand that feeds' them.

We are left with the general impression that the majority of countries are succeeding in closing the participation gap in terms of access or horizontal gender equality, but that vertical segregation (focusing on recognition, rewards and advancement) remains a challenge.

The second part of the study then aimed to determine what initiatives are used to increase and ease the participation of women in SET (or to address the main causes for the relative unequal participation of women in SET). A documentary analysis study design was used in an attempt to answer this question that consisted primarily of desktop literature searches and categorisation. A previously-established database of initiatives (Bailey et al, 2004) was used in conjunction with various library and online resources to determine popular trends as well as detailed descriptions of initiatives (mostly websites). *Chapter 4* provided the general overview of the most common levels and modes of interventions currently used in the field as they relate to (1) policy interventions, (2) gender mainstreaming, (3) the role of advocacy and interest groups, and (4) the provision of training and support. Besides the general literature on the particular topic, a total of 123 initiatives were also identified and summarised. An initiatives summary framework was designed to provide some structure for the capturing, analysis and reporting of the data on these initiatives. The decision regarding which initiatives to include in the final database was based on the volume of available online information for each; on the credibility of the source; and whether the majority of variables in the initiative summary framework could be populated to some degree of satisfaction. Each initiative

was summarised using the initiative summary framework (*Table 5.2*) and then populated in terms of *objectives, intended outcomes, type of initiatives, core activities, level of intervention, drivers and target groups*. Although the majority of initiatives are not explicit about addressing the main causes for the unequal participation of women in SET, an attempt was made to also populate and interpret these findings where relevant. These statistical findings were presented in *Chapter 6*.

Current initiatives

The majority of initiatives focusing on increasing and facilitating the participation of women in SET are of a corrective nature, either trying to help women adjust to the existing environment or requiring the environment to accommodate women. The literature rather proposes a more preventative methodology, aiming to bring about long-term structural change with an underlining life-cycle approach installed in all education and training systems with gender and equality addressed on a continuum of learning and development. It is further suggested that such change, which implies systemic, structural and attitude adjustments, will only start showing some results after a period of ten or more years. Furthermore, that such change is only possible with the commitment and participation of all role players (government, legislators, education system, scientific community, funding institutions, media and industry) at each level of engagement (school, tertiary level and workplace) (Lane (1999), Achmad (2000), Bonder (2000), Haataja et al (2006)).

The most common levels and modes of interventions used in the field were discussed as they relate to (1) policy interventions, (2) gender mainstreaming, (3) the role of advocacy and interest groups, and (4) the provision of training and support.

Policy: In countries where there is evidence of governments valuing research and gender equity is a national priority, good policies accompanied by good practices are the norm. At a regional level such as the EU, this has been evident in the actions and results of the EC that have over the past ten years been able to address the initial policy focus on access, progression and increased representation at 'the top' rather effectively. The EC has also subsequently progressed to a focus on 'excellence in science' – the ultimate goal no longer being equality in science but rather quality in science – the equal participation of all available potential that is able to respond to the needs of all human beings. The UK provides a prime example of how the promotion of women in SET has been driven at national level. The process started and was driven by a Government White Paper (*Realising our Potential*, 1993) highlighting the importance of SET for the UK's growth and development and the importance of women's role in this. Eventually the result was a Strategy for Women in SET (2003) that determined the challenges women in SET face and the role government and stakeholders should play in bringing about the necessary change. Funding and structures have also subsequently been put in place to roll-out and strengthen the process. At institutional level various examples exist, especially so for tertiary institutions, of how policy formulation is used to bring about gender equality in SET. Popular examples include compulsory gender equity plans, special funding programmes for gender equity schemes and awards for policy implementation that leads to the promotion of female employees.

Gender mainstreaming is a popular measure used by various nations in addressing gender equity. Mainstreaming does however only really become effective when applied both vertically (the transfer of experiences and best practices on institutional, political/legislative and administrative level) and horizontally (the distribution of experiences and best practices between institutions) and when the bodies responsible for enforcing such measures have the necessary understanding and data required (Haataja et al, 2006). A prime example is the Helsinki Group who has managed to set up statistical correspondents and country specific databases across Europe, enabling them to produce such publications as *She Figures*, the broadest collection of European data on women and science. This collection has influenced benchmarking and statistical policies across Europe. A relatively new concept in mainstreaming is gender budgeting, which proposes that the gender dimension be considered in all aspects of budgeting such as planning, adoption, implementation, auditing and evaluation and at both national and institutional level.

Although policies and mainstreaming are most often seen as the first and most effective tools for increasing and facilitating the participation of women in SET, these measures frequently only become truly effective when accompanied by additional action.

Mutual interest groups: When government and decisionmakers are seen to be ineffective or slow in implementing such measures there is a tendency for mutual interest groups to collectively organise and mobilise themselves through advocacy and lobbying activities in pursuit of such change. Examples of such 'successful networks' include the European Platform of Women Scientists (EPWS), Women in Research Decision-Making (WIRDEM) Expert Group, and the Organization for Women in Science for the Developing World (OWSD), previously known as TWOWS.

Training and support for women studying, entering, working and trying to progress in SET has become increasingly popular and forms part of almost all initiatives aimed at increasing and facilitating the participation of women in SET. The training component is primarily focused on the professional and skills development required for women to prepare and progress through the various stages of participation in SET. A secondary focus of training is then also to sensitise and empower decisionmakers about the value and requirements for increased participation of women in SET at all levels. The support component addresses both the physical and emotional needs of women entering and working in SET. Physical support includes aspects such as financial support for further studies, adjusting the work environment to accommodate domestic responsibilities and addressing issues of re-entry and mobilisation. Emotional support is offered mainly through traditional and online mentoring, where senior women and also peers share their burdens and experiences and offer advice and encouragement on how to succeed through the various stages of a SET career.

Database of initiatives

A database of 123 initiatives was designed to add further value and elaborate on the above findings about current initiatives for women in SET. The analysis aimed to shed light on:

- Who are the main drivers of these initiatives?
- Who is being targeted?
- With what objectives in mind are these initiatives designed?
- What type of interventions are being used?
- What challenges are potentially being addressed?

Main drivers: The majority of initiatives are driven by a combination of government and academia and aim to bring about change at a national/policy level, and to a lesser degree at institutional level. Academia also partners with industry in a number of cases and clearly plays a significant intermediary role, while assisting government on the one hand in policy design and implementation and on the other hand meeting the human resource needs of industry. The general impression is that government and academia as leaders in this field have been driving initiatives to especially increase the participation of women in SET (with a huge focus on access). All role players, and particularly industry, have however been slow in responding to facilitating participation once women become active participants of the SET workforce.

Target groups: Initiatives identified various target groups including school girls, students, women generally working in SET, women working in a specific subsector of SET, entry-level young scientists, senior women in SET, and policy and decisionmakers. Most initiatives focus their attention almost equally on all of these target groups. This could be an indication of an encouraging development where the main actors realise that a holistic approach is needed to approach this challenge and that women require interventions at the various levels of access and participation. Alternatively, this could indicate a lack of focus and a division of resources that might be better aimed at a particular target group at critical times of intervention. The most worrying finding in terms of “target group” is the very few initiatives targeting returners and employers. This supports the literature that also indicates this as very significant but neglected sub-group.

Objectives: The most popular aim and objective of interventions is ‘increasing the support for women in various stages of their SET careers’. This is encouraging as it suggests that there is acknowledgement that women in SET are challenged at each stage of their participation in SET, requiring various forms of physical, financial and emotional support. Further to this, that access is just one aspect of participation and once gained the ease of participation also requires unique intervention. This is supported by the finding that the next most popular objective is ‘expanding the participation of women in SET’ referring to both the quantitative and qualitative aspects of participation. Other objectives that were highlighted by initiatives that also speak to these qualitative aspects include: increasing the probability for progression in SET careers; and awareness-raising of the potential for women to enter SET; and of increasing the abilities of those already working in SET while facing challenges. Increasing the access to SET is however still a main objective for more than half of all initiatives and especially so for those targeting school girls and students. This supports the literature that emphasises the reality of certain regions and countries not yet ensuring equal access to

SET knowledge, SET studies and SET careers for both sexes (Haataja et al (2006), Ringrose & Epstein (2008), EC (2009a), WEF (2010), NSF (2010, 2011)). The finding that the objective of 'retaining women in SET' is not a priority for most initiatives is rather disturbing as it once again highlights the focus on access while potentially forgetting to ask who is leaving the system and why. Initiatives operating at national level do however show some concern with this particular objective as well as with the monitoring and evaluation of female participation in SET.

Intervention type: The most common type of intervention for addressing the need to increase and facilitated the participation of women in SET is networking and support. These initiatives are characterised by providing formal and/or informal opportunities for networking with peers and leaders within SET (such as mentoring) most often with the purpose of sharing experiences and extending support. The popularity of these kinds of interventions, as mentioned previously, is most probably related to the 'unwritten' survival techniques that both men and women, peers and leaders provide during such interactions and to a sense of not 'going it alone'. While at the same time providing encouragement to each other and a space to learn from each other's successes in managing and overcoming challenges. This again latches onto the notion that there might be a subtle shift from increasing participation (quantitatively) and specifically access, to one of facilitating participation (qualitatively). Closely related to these types of interventions are information dissemination type initiatives and associations/grouping/coordinating bodies that are becoming increasingly popular. Information dissemination type initiatives have the potential to reach policy and decisionmakers, the SET workforce and the general public across borders and divides and in a coherent and cost-effective manner. Associations on the other hand have the potential to zoom in on a specific subsector of SET and address their unique needs and challenges. Education and funding and award-type initiatives are also very popular and are most commonly associated with institutional level interventions as it complements their core function of equipping both students and staff with the necessary knowledge and skills to function and progress in their scientific careers.

Causes: The majority of initiatives are not explicit regarding their focus on the particular causes for the relative unequal participation of women in SET, as categorised in this study. Our analysis confirms the trends discussed in *Chapters 2 and 4*. From the few initiatives that did make some reference to these causes, the majority are focused on addressing the unequal access for women to SET, followed by attaining the recognition and reward women in SET deserve; addressing the male-dominated nature of science; assisting women in SET to maintain a healthy work-life balance; and finally with increasing the representation of women in leadership positions within SET. As the debate around female participation in SET originally centred on access, it is not surprising that the majority of initiatives have focused on this particular cause and as the literature and data indicate great strides have been made in this area. The data further indicates that this is mainly being achieved through the use of education and training, information dissemination and national strategies and programmes mostly driven at national level. The difference in recognition and reward is currently one of the main topics in the literature on women in SET and therefore it is encouraging to note that this is the cause that is next in

line to receive attention from the various initiatives. Types of initiatives most commonly associated with this cause are awareness-raising, funding and award type interventions. Both the challenge of attaining a healthy work-life balance and the lack of female representation in SET leadership, although well documented, received limited direct intervention from the initiatives listed in the initiatives database. The few initiatives that do target these challenges are informal and function at institutional level where peers and employers offer guidance and, in some cases, physical and financial support to address the challenge of a healthy work-life balance and the lack of female representation in SET leadership. A few funding and reward type schemes have also been rewarding women for progressing in SET while also recognising institutions and employers that assist their female scientists in pursuing leadership positions in SET. A number of female leaders have also started forming coordinating bodies/networks for the purpose of supporting each other, sharing experiences and grooming the female leaders of the future.

7.1.1 Contributions

Over the past thirty years, a considerable volume of international research has been produced on the status of women in SET, very little of which has been generated in South Africa. The study has aimed to stock take – broadly providing us with a picture of what the leakages in the pipeline look like currently, what has and is being done to address these and also to direct us to where the focus might need to shift. The study also produced the database of initiatives that can be used as a resource for researchers, policy and decisionmakers and programme designers for research and planning purposes. We are left with the following main conclusions:

- The majority of countries are succeeding in closing the participation gap in terms of access or horizontal gender equality, but that vertical segregation (focusing on recognition, rewards and advancement) remains a challenge.
- Male scientists are slowly losing their dominance (quantitatively) in the SET workforce with the proportion of female scientists growing at a steady pace. Qualitatively, however many women still describe a work environment where men dictate the scientific agenda, the measurement of success, and the masculine qualities required to compete and progress in SET.
- The literature is inconclusive regarding the ability of women to reconcile a professional and private life. Some studies support the perception that a successful scientific career is not compatible with the roles of partner and/or parent, while others report that when the necessary support structures are in place, such a balance can be achieved and in certain instances even enhance the output and quality of female scientists work.
- In terms of differences in recognition and reward, women are slowly increasing their portion of the research funding success rate with the EU-27 reporting almost equal awarding in most cases. Issues of concern are however the presence of gender bias in the awarding of research funding, women being less likely than men to apply and reapply for funding, and when they do apply it is usually for less prominent funds and for shorter periods.

- Equal pay for equal work is most definitely not yet a reality for women working in SET. Not a single country employs this principle to date despite the fact that some even have legislation to the effect.
- The lack of female representation in SET leadership is evident in the gender composition of the membership profile of academies of sciences, scientific boards, and the publication boards of academic journals. The result being that the ability of female scientists to influence the setting of the research agenda, the allocation of research funding and resources and to advocate for equal access and participation for women in SET is limited.
- South Africa has followed international growth patterns as regards to equal access to SET, although at a slightly slower rate and the gap remains substantial in terms of female doctoral graduates. South African female scientists are increasing their proportion of the SET workforce and encouraging report finding it somewhat less stressful working in a male-dominated environment and managing a healthy work-life balance. Racial discrimination however is still a reality for many black women who report feeling marginalised and challenged without receiving the necessary training and support. In terms of recognition and reward, female South African scientists are not receiving equal amounts of funding, remuneration or rewards. As is the case worldwide, South Africa also has limited female representation in SET leadership.
- The challenges women in all parts of the world face are very similar although they might play out in varying contexts, indicating that there is much room for learning and collaboration in facing these challenges. Examples of progressive countries and institutions also provide an indication of how the process usually unfolds as a country's focus on SET and women evolves and starts to paint a picture of what this debate might end up looking like in a few years time. The subtle shift seems to be from advocating for equal access and participation to advocating for participation allowing women to take part in a manner that enhances both the quality and agenda of science.
- Currently the most common modes of intervention can be grouped together as policy interventions, gender mainstreaming, advocacy and interest groups, and the provision of training and support.
- To date the EC has been the most significant role player in designing and implementing policies aimed at increasing and facilitating the participation of women in SET. Their success can be attributed to gaining the political will and cooperation of various governments, adequate resources, sufficient structures and effective monitoring and evaluation directing their policies and planning. Related to strong gender policies has been the successful application of mainstreaming in increasing particularly the access to SET and that this mode of intervention is most effective when both horizontally and vertically applied, and with the necessary measures to implement and enforce.
- The majority of initiatives are also then aimed at bringing about change at a national/policy level. This is the level that has been most effective in addressing the participation of women in SET. These types of interventions are driven primarily by government and academia with

academia playing an importance middleman role - assisting and guiding government in the design and roll-out of policies on the one hand and meeting the human resource needs of industry on the other.

- Government and academia have done well in driving initiatives that increase the participation of women in SET at both school and tertiary level but once women become part of the active workforce industry needs to be doing more to drive the facilitation of participation.
- The majority of initiatives aim to increase the support for women in the various stages of their SET careers. This could possibly be related to (1) the acknowledgment that women face a variety of challenges throughout their involvement with SET and every stage requires both tangible and emotional support, and (2) a shift in focus from access of women to SET to supporting and retaining them.
- The most common type of intervention for addressing the participation of women in SET is networking and support. These initiatives are characterised by providing formal and/or informal opportunities for networking with peers and leaders within SET (including mentoring), most often with the purpose of sharing experiences and extending support.
- Only initiatives operating at a national level of intervention are most concerned with the retention of women in SET while others seem to still be focused on increasing the access and ease of participation. They are not paying much attention to the turnaround of the female SET workforce.
- For the few initiatives that do explicitly indicate trying to address some of the main causes for the relative unequal participation of women in SET, the causes, in decreasing order, are: (1) the unequal access for women to SET, (2) attaining equal recognition and reward, (3) addressing the male-dominated nature of science, (4) assisting women in SET to maintain a healthy work-life balance; and (5) increasing the representation of women in leadership positions within SET.

7.2 RECOMMENDATIONS

The final recommendations of this study are captured well in the following quote:

Active policies and programmes addressing all dimensions of gender inequality in SET, both at national and regional levels; political will of national and international organizations, financial investment in policies and programmes, participation of different sectors, trained human resources in gender planning and evaluation, long-term projects, creation of new indicators and continual monitoring systems, regional and inter-regional exchange and cooperation, and raising public awareness and support of this issue. (Bonder, 2000: 338-339)

- (1) To encourage such participation by all potential role players, to monitor progress and to plan effectively, the collection of sex-disaggregated data at regional, national and institutional level is crucial. National legislation, structures and procedures need to be put in place in countries where this is not yet the case and such statistics should include data on school and subject

participation, higher education participation at degree and post-degree level, and on the composition of the SET workforce.

- (2) Countries and institutions also need to be realistic about their general attitude towards gender equity and know that gender equality in SET can only be possible if this is also in line with the overarching national priorities and policies. It is recommended that the development of achieving such gender equality in SET, especially from a policy perspective, be studied using the EU as a prime example. Finland, Norway, Sweden, Denmark and Iceland are seen to be the proactive leaders in promoting and monitoring gender equity in SET and should be investigated more closely.
- (3) The EU's success in increasing and facilitating the participation of women in SET across Europe is also due to their ability to collectively mobilise a region. It is recommended that other regions could learn from this model and that it could possibly be reproduced within a particular context.
- (4) At national level, the UK's success in this area, for example, can be assigned to the ability and commitment of a national strategy for women in SET that translated well from paper into practice and is now managed by a complete unit assisting other sectors in reproducing such results. Similar initiatives exist to some extent in the public sector in South Africa, but it is not clear how this is extended to the private sector and what measures are in place to ensure compliance. Initiatives, such as the Total E-Quality award used by the EC to encourage and award institutions and companies that not only put policies but also practices in place to ensure equal opportunities for female employees could be considered to support policy and legislative sanctions.
- (5) At institutional level, such measures as gender equity plans for tertiary institutions, equal opportunity officers, ranking of institutions according to gender equality measures, science bursaries for female PhD studies, fast track programmes for senior positions, and funding of gender projects and grants are proposed.
- (6) The importance of advocacy and lobbying bodies to continually bring the debate of women in SET to the table at regional, national, institutional and sector level must also be acknowledged and utilised more effectively. The formation of more such bodies are encouraged as well as learning from and working with such bodies as EPWS, the WIRDEM Expert Group and the OWSD.
- (7) The data indicates that the majority of initiatives are strongly driven by academia, followed by government and public institutions with limited involvement from industry and the NPO and funding sectors. As academia is the binding force it is recommended that tertiary institutions

start to take a stronger lead in not only increasing the participation of women in SET within their own institutions but also in advocating and empowering government and industry to do the same.

- (8) In terms of funding for women in SET, it is recommended that the European model be reviewed including their national policies on gender balance targets, legislation on gender quota, and policies on university funding based on gender equity performance. Also to consider not only making more funding available for women in SET, but also to actively target specific women in SET to apply for such funding and to encourage them to apply for more funding, to re-apply regularly and for longer periods.
- (9) More initiatives will have to be designed to specifically address the absence of women in governing and decisionmaking positions within SET in order to ensure women have an influence in setting the SET research agenda, in the allocation of resources and funding and to ensure access and progress for other women in SET. Such initiatives should be monitored by government and initiated by academies of sciences, scientific boards, publication boards, research councils and higher education management boards. More transparency is also needed in how these management boards are selected.
- (10) In terms of specific types of initiatives, networking and support feature strongly in almost all countries, but these types of initiatives are still lacking in South Africa. Especially within subsectors of SET women and decisionmakers are encouraged to establish such networks and opportunities for sharing and supporting among women. Also e-mentoring is becoming very popular, especially across Europe and the US, and this type of initiative could be easily applied within the SA context as a relatively inexpensive method to bring various roleplayers together and to assist young girls, students and women entering SET across time and geographic divides.
- (11) Two target groups that are mentioned in the study but are somewhat neglected at present are employers and returners. Much more has to be done to motivate and reward good SET employers. Employers themselves also need to design policies and practices that promote the entry, participation, retention and progression of women in SET careers. Such policies and procedures should include: open and fair recruitment and appraisal policies; work-life balance policies; sexual harassment policies; diversity training at all levels; flexible working conditions, in other words job-sharing, working from home, flexi-time; opportunities for networking with other women in SET; encouragement of female representation on professional association boards; mentoring programmes; and programmes that encourage female scientists to return to the field of science after a career break.

(12) Returners usually have all the necessary knowledge and drive to continue with a career in SET but due to the restrictive nature of the field are often lost to other sectors. If this group is not addressed the resources that were put in place to equip them and the collective knowledge they possess will remain unutilised and this effect will accumulate over time. Therefore the sector needs to seriously consider the wants of this group and start making provision for such breaks in the careers of female scientists and on how to accommodate them on their return. These plans should also not be left to chance but rather be seen as a crucial part of strategic planning. They need to start seeing the bigger picture – for the reality is that women will go where their needs are met – and these will be the institutions that might not have ‘traditional scientists working in traditional settings’ – but most probably the ones with well balanced, focused and excellent scientists doing their best for an institution that acknowledges and accepts them for who they are.

(13) Furthermore, the literature also points to the important role male policy- and decisionmakers play in influencing the thinking of their peers and in paving the way for women. No initiatives currently exist that specifically target men as potential gatekeepers and advocates for women in SET and it would be interesting to see if such an approach would indeed bear fruit.

(14) From a South African perspective, all of the above is relevant but the reality must be faced that not only gender but also racial discrimination needs redress. Black women are also seen as the most marginalised group in South Africa and especially with regards to mainstreaming and funding initiatives, this needs to be considered. Race has been addressed to some extent and the strategic focus at some point will have to shift to gender more intensively.

(15) Finally, cognizance has to be taken of the shift towards ‘excellence in science’ – with the ultimate goal no longer being equality in science but rather quality in science – thus the equal participation of all available potential. The move is subtle but implies much and especially so for a country such as South Africa where this will certainly challenge and direct the way we see and address the issues of women in SET in the near future.

7.3 DIRECTIONS FOR FURTHER RESEARCH

Some suggestions for further research include:

(1) A data collection exercise of female representation in leadership positions within SET with a specific focus on the membership profiles of academies of sciences, scientific boards and publication boards of academic journals. The collection of historic data is also encouraged, as this would assist the field in establishing if representation is indeed increasing and at what pace.

- (2) Data on salaries for women working in SET is very limited. The EC and the NSF (US) have only recently started collecting this data. Such data is vital if the SET field aims to advocate for equal recognition and reward. Research done by the EC and NSF in this regard could be studied further and adjusted for national use (especially also for the SA context). Once again, the collection of longitudinal data spanning across the public, higher education and private sectors would enable researchers to study trends on a horizontal and vertical level.
- (3) Both the European and South African data seem to hint towards using the age distribution of women working in SET as a potential indicator for measuring the participation of women in SET (both quantitatively and qualitatively). For the European context, it was found that the majority of female scientists in the south of Europe are aged between 25 and 34 years of age, compared to the north of Europe where the majority of female scientists are between the ages of 45 and 64. A possible explanation being that countries in the south have been lagging behind in addressing gender equality in SET and have only more recently started promoting the potential participation of women in SET. The focus has seemingly been on improving access and particularly so on increasing the number of female SET graduates. The northern countries have however been more progressive in achieving gender equality in SET and have already achieved the majority of gender targets in terms of access at higher education level. Therefore, their focus has probably shifted towards facilitating the participation and retention of these older and more experienced women in SET. It is suggested that this potential relationship between the age of female SET workforce and focus in terms of participation be further investigated.
- (4) Within the South African context the findings indicate that older female scientists are generally more negative in their views regarding their challenges as women working in SET, while the majority of younger female scientists are more positive. A study is proposed to determine the age distribution of women working in SET and the relationship of age to the attitudes of women working in SET and their perceived and actual progress.
- (5) The study identified the EC as the most influential body in promoting an understanding of the realities faced by women working in SET and in setting policies in place to increase and facilitate the participation of women in SET. As such, a case study is proposed of the evolution of the EC's approach to women in SET and the possible application thereof in the African context.
- (6) There is limited data available on the participation of women in SET within the private sector. Furthermore not much is written up on initiatives within this sector that are aimed at increasing and facilitating the participation of women in SET. A review of initiatives particularly active and housed within the private sector is suggested. The inclusion of a number of

subsectors is also recommended, as it is suspected that some variance will potentially be found between industries.

- (7) The study found that only 26% of the reviewed initiatives have undergone some form of evaluation. It is therefore recommended that a number of the well-established initiatives be formally evaluated.
- (8) 'Returners' have been identified as a target group that has not received much attention in current literature and in the recent interventions aimed at women working in SET. A quantitative study of the experiences and needs of female returners to SET is proposed.

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Appendix A**European Commission Women in SET Policy documents**

Date	Policy document	Summary
1998	ETAN Report (Science Policies in the European Union “Promoting excellence through mainstreaming gender equality”)	<p>The report reviews the position of women in S&T. It concludes that the under-representation of women threatens the goals of science in achieving excellence, as well as being wasteful and unjust. The report makes recommendations to a wide range of bodies, including the Commission, the European Parliament, the Member States, and organisations that educate, fund and employ scientists. The report comments on:</p> <p>The lack of adequate gender monitoring statistics and recommendations include a directive on gender monitoring for employers, new Member State laws on gender balance on public bodies and on access to public records, and the improvement and harmonisation of the gender dimension of databases held by the EU and Member States.</p> <p>The possibilities of implementing a mainstreaming policy in science.</p> <p>The sex-stereotyping of science and scientists that needs to be addressed – various strategies to encourage women to enter and remain in science are recommended.</p> <p>A statistical review of the position of women in SET at both EU and Member State level and reports that despite country variations in systems and structures, the proportion of women in senior positions is consistently extremely small.</p> <p>The need for more sophisticated and transparent means of assessment of merit – both sexism and nepotism are documented as interfering with the peer review process.</p> <p>The lack of support from employers of female scientists in addressing the life/work balance struggle of women in SET.</p> <p>Some key recommendations include:</p> <p>The mainstreaming of gender equality into the Sixth Framework Programme and into Member State programmes that fund S&T including a set of proposals for specific activities within the Framework such as support for both female and male scientists in independent positions; ‘one time grants’ to provide innovative funding for women; resources for networks designed to increase communication between scientists; and other novel initiatives to benefit women in science.</p> <p>Measures to develop best practice policies in the recruitment and employment of scientists, to evaluate and achieve gender parity in academia and to ensure high quality standards in peer review and selection procedures.</p> <p>Measures to eliminate the gender pay gap.</p>

		The importance of monitoring and reviewing, and of using financial incentives to ensure progress on the equality agenda, is stressed.
1999	Women and Science: Mobilising women to enrich European research report	<p>The report highlights the increasing awareness of the under-representation of women in scientific research and technological development by the EU, the European parliament and the scientific community at large. It stresses that a greater involvement of women in research would enrich European science, in terms of its methods, the subjects on which it focuses and the objectives assigned to scientific research. The report reflects that the under-representation of women in research is the result of a large number of very varied factors and that a better balance between men and women in an enriched world of scientific research can be achieved by a systematic, step-by-step approach. Accordingly, the Commission undertakes to pursue two objectives:</p> <p>To stimulate discussion and the sharing of experience in this field among the Member States so that action can be taken as effectively as possible at all levels of power.</p> <p>To develop a coherent approach towards promoting women in research financed by the Union, with the aim of significantly increasing the number of women involved in research during the period of the Fifth Framework Programme. The Commission's aim is to achieve at least a 40% representation for women in Marie Curie scholarships, advisory groups and assessment/monitoring panels.</p> <p>The report goes on to describe what action has been and will be taken by the Commission in the field of research and technological development to achieve these two objectives, presenting it against the more general background of European Union policy on equal opportunities, on the one hand, and the action taken in the Member States on the other hand.</p>
2002	National policies on women and science in Europe	The report describes existing national policies and practices aimed at promoting the participation of women in science in 30 European countries, represented by the group including networking, quotas and targets, role models and mentoring, earmarked chairs, research funds and prizes.
2003	Women in industrial research – A wake-up call for European industry	<p>This report was aimed at filling the gap in the lack of available information concerning the situation of women in industrial research, providing a review and possible strategic direction. The report combines information about women researchers in industry from a variety of sources and presents a first analysis of the context. It constitutes a starting point in terms of</p>

		outlining actions to be taken and identifying areas for further investigation. The report shows how industry is implementing new structures and instruments to promote gender equality and diversity.
2003, 2006, 2009	She Figures	She Figures is published for the first time in 2003, consisting of a compilation of key data, presenting latest figures on the participation of women in science at tertiary and employment level. This document for the first time makes available the sex-disaggregated data on human resources in the European Research Area (ERA). Subsequent reports were produced in 2006 and 2009. All countries involved in this activity are now able to monitor the indicators and to observe changes in the gender dynamics of the ERA. So for instance <i>She Figures 2006</i> showed a slight improvement in the participation of women in SET from the 2003 report and <i>She Figures 2009</i> showed even a larger increase in the proportion of women in research, especially at the top level (although much room for improvement still remains).
2004	Waste of Talents- Turning private struggles into a public issue	The Research Directorate-General commissioned this report in order to assess the conditions and status of women scientists in the Central and Eastern European countries and the Baltic States. Following the ETAN report on “ <i>Science policies in the European Union - Promoting excellence through mainstreaming gender equality</i> ”, which dealt essentially with the situation of women scientists in the current EU Member States, this report is the result of one of the actions of the <i>Science and Society Action Plan</i> : to promote gender equality in science in a wider Europe. The report investigates the situation of women scientists in the Enwise countries, providing an insight into the situation from a historical, as well as a contemporary perspective. It reveals the large proportion of highly-qualified women scientists working in the research institutions of the Enwise countries in very poor conditions, representing a real waste of talent for both their national scientific communities and the European Research Area. The report also warns that should the situation not be improved, there is the additional risk that these underutilised skills will have a negative impact on the younger generation and deter them from entering science. The report also shows that while formal legislation is an absolutely necessary condition, it is not sufficient to guarantee equality. The report also calls for changes in mentalities and in working conditions. Institutions have a role to play in supporting or encouraging these changes, by questioning norms, setting new standards,

		monitoring progress in order to allow women scientists to take full advantage of and contribute to the European Research Area.
2004	Excellence and Innovation – Gender Equality in Science	<p>The report gives an overview of women and science actions implemented at European level since the Council Resolution and of the results achieved. In particular:</p> <p>Activities of the EC to promote gender equality in science through the Research Framework Programmes and in the context of the Science and Society Action Plan.</p> <p>Progress made in increasing the participation of women in science in the EU Member States since 1999, taking into account EU enlargement.</p> <p>Progress made by the Commission in reaching the target of 40% participation of women at all levels in implementing and managing research programmes.</p> <p>Progress of the WIR (Women in Industrial Research) initiative, as requested by the European Council in its Resolution of November 2003.</p> <p>The report demonstrates that although some progress has been achieved since the adoption of the previous reports in 1999 and 2001, the situation is still far from satisfactory with a view to preparing the 7th Framework Programme. Challenges that must be addressed if real progress is to be made in achieving gender equality in science are highlighted as:</p> <p>Empowering women in decision-making positions in research and technology.</p> <p>Reconciling professional and private life.</p> <p>Gender and scientific excellence.</p> <p>Strengthening gender research.</p> <p>Increasing the participation of women in SET.</p>
2006	European Charter for Researchers and Code of Conduct for the Recruitment of Researchers	<p>The European Charter for Researchers is a set of general principles and requirements which specifies the roles, responsibilities and entitlements of researchers as well as of employers and/or funders of researchers. The aim of the Charter is to ensure that the nature of the relationship between researchers and employers or funders is conducive to successful performance in generating, transferring, sharing and disseminating knowledge and technological development, and to the career development of researchers. The Charter also recognizes the value of all forms of mobility as a means for enhancing the professional development of researchers. In this sense, the Charter constitutes a framework for researchers, employers and funders that invites them to act responsibly and as professionals within their working</p>

		<p>environment, and to recognise each other as such. The Charter addresses all researchers in the EU at all stages of their career and covers all fields of research in the public and private sectors, irrespective of the nature of the appointment or employment the legal status of their employer or the type of organisation or establishment in which the work is carried out. It takes into account the multiple roles of researchers, who are appointed not only to conduct research and/or to carry out development activities but are also involved in supervision, mentoring, management or administrative tasks.</p>
2007	Study on the remuneration of researchers in the public and private commercial sector	<p>The main purpose of the study is to have a clear picture of the remuneration of researchers in Europe (EU25 and Associated Countries). The study collected information on the gross and net remunerations of researchers in the public and private commercial sectors. The study also discusses researchers' career recognition, which seems to have fallen behind compared to other professions. The results of the study, carried out from May 2006 to March 2007, show the remuneration scheme of the researchers in Europe, and compare it against the situation of researchers in other countries (Australia, China, India, Japan and the US), as well as against the remuneration schemes of other similar professions in each country.</p>
2007	Mid-Term Assessment of Science and Society Activities	<p>At European level, "Science and Society" was a new initiative that was undertaken under Sixth Framework Programme (FP6). Its main objectives were formulated in the Science and Society Action Plan, which led to a broad range of activities numbering about 150 projects, conferences and forums. The programme is organised into five thematic areas: (a) Science Education; (b) Scientific Advice and Governance; (c) Ethics; (d) Women and Science; and (e) Science Communication.</p>
2008	Benchmarking policy measures for gender equality in science	<p>The report provides an update on the national policies and on the statistical profiles of the 33 countries represented in the Helsinki Group, and it introduces for the first time data from the Western Balkans. This report builds on the previous one and evaluates the policies and measures with indicators measuring the presence of women in science. It gives an overview on the various national situations and tries to develop a European synopsis.</p>
2008	Mapping the Maze: Getting more women to the top in research	<p>The aims of the expert group on Women In Research Decision Making (WIRDEM) have been to identify and review positive actions and gender equality measures at institutional and national level to promote women into senior positions in public research. The report examines and describes in detail</p>

		nomination procedures, obstacles, facts and funding limitations that women need to overcome in their academic careers. It reviews the procedures for evaluating and promoting research personnel to senior positions and identifies examples of good practice at national and institutional levels. Based on this analysis, the report proposes recommendations to facilitate the design of a framework for better targeted actions at European level, and highlights the problem of poor awareness and visibility. It clearly determines that transparent and fair evaluation and promotion procedures alone are not sufficient to improve gender balance in research decision-making; a change of culture is required. The report therefore also makes suggestions as to how the prevailing scientific culture could change to become more inclusive.
2009	Gender challenge in research funding	The Gender and Excellence expert group was set up to provide recommendations on the improvement of transparency in the procedures used in selection committees for the awarding of grants and fellowships and in access to research funding in general. The report provides national data for all 27 Member States and six Associated Countries to the 7th Framework Programme. This European level synthesis highlights the existence of good practices in the field of transparency and accountability of research funding systems which could be applied in other settings. The expert group did not find a large and systematic gender imbalance in terms of success rates in research funding in the funding systems studied, although a few exceptions exist. However, there is a clear difference in application behaviour: women are less likely to apply for funding than men, and this needs further study. An overview of the national situations in terms of research landscape and gender settings is annexed to the report.

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Appendix B**Summary of Initiatives**

*In most cases, information in this section has been taken directly from the websites of the group concerned.

1. Helsinki Group on Women and Science	
Country/region	15 EU member states associated with the Fifth Framework Programme of the European Community for research, technological development and demonstration activities. Associated countries are Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Iceland, Israel, Latvia, Lithuania, Malta, Norway, Poland, Romania, Slovakia, and Slovenia.
Level of intervention	Local, regional, national and European level – influencing policy.
Who is driving it?	Combination of public, industry and academia. 15 EU member states.
Sector focus	S&T general.
Target group	Women in science in European Union member states and countries.
Type of initiative	Association/grouping. Participation - national policy to encourage and monitor the participation of women in scientific careers.
Description of initiative	<p>This group, which met for the first time in Helsinki, and is now commonly known as the Helsinki Group on women and science, has provided an important forum for dialogue about national policies and for sharing and comparing experiences.</p> <p>The mandate of the group is to:</p> <ul style="list-style-type: none"> - Promote discussion and exchange experiences on measures and policies devised and implemented at local, regional, national and European level to encourage the participation of women in scientific careers and research; - Provide national sex-disaggregated statistics; and - Develop gender sensitive indicators in order to monitor the participation of women in European research.
Activities	<ul style="list-style-type: none"> • Set up national steering committees to address factors of scientific infrastructure, equality measures and the climate of women seeking to pursue scientific careers. Through these, most countries have taken initiatives to address the participation of women in science. The most common initiatives are networks of women scientists, development of role models and mentoring schemes, target setting, academic chairs, research funding and prizes for women in science. • Gender mainstreaming has also become very popular amongst the various countries. In an effort to support, mainstreaming countries are also in the process of setting-up statistical databases containing sex-aggregated data that conform to the Frascati Manual and Eurostat conventions. Other gender mainstreaming measures that are being put in place relate to gender studies, human resource practices focused on transparency in recruitment and promotion and work/life balance. • Collective design of monitoring and evaluation tools to identify and promote successful initiatives.
Outputs	The group of statistical correspondents, a sub-group of the Helsinki Group, has strongly influenced benchmarking and statistical policies by producing such publications as the She Figures 2003, which contains the broadest collection of European data on women and science. Their influence is also visible in the fact that

	sex-disaggregated data has been integrated into the data Eurostat collects, making it possible to produce a variety of gender-sensitive indicators used to measure the success rates of males and females in achieving senior positions and their levels of access to research funding. After two years of joint activity, the Helsinki Group members produced national reports on the situation of women scientists in their respective countries.
Intended outcomes, effect	<ul style="list-style-type: none"> • Increased participation of women in scientific careers and research in Europe. • National sex-disaggregated statistics. • Gender sensitive indicators that can monitor the participation of women in European research.
Evaluation	N/A
Sources/references	http://cordis.europa.eu/improving/women/helsinki.htm

2. Central European Centre on Women and Youth in Science (CEC-WYS)	
Country/region	Europe
Level of intervention	International, national, local and institutional - policy and implementation.
Who is driving it?	European Commission - public service. Was funded for the period 2004-2007 by the European Commission under Framework Programme 6. Partners from Czech Republic, Hungary, Slovenia, Slovakia, France, Romania and Italy contributed to the project's diverse activities.
Sector focus	S&T general.
Target group	Woman and young scientists in Central Europe.
Type of initiative	Coordinates women and science activities with partners in other countries.
Description of initiative	<p>The objective of CEC-WYS is to empower woman and young scientists in Central Europe and to contribute to achieving gender equality in R&D. Working within this broad objectives framework, CEC-WYS aims to achieve the following:</p> <ul style="list-style-type: none"> • Increase the visibility and participation of women scientists in national, European and international research by making actions to mobilise and network women scientists; also to increase their inclusion on advisory boards and scientific committees. • Increase the participation of women in decision-making and evaluation procedures of Framework Programme funding. • Foster reflective practices by raising awareness of the implications of gender dimension of scientific research. • Encourage policy developments at national level concerning the issue of women in science. • Prepare young researchers to take ownership of their research projects, and develop their skills in communication and responsible conduct of research, and provide them with the skills and reflection to develop into effective supervisors and mentors. • Initiate actions to mobilise and network young scientists in order to advocate their interests in a policy debate particularly from a regional and gender perspective.

Activities	<p>Raising visibility and the inclusion of women scientists in the scientific community:</p> <ul style="list-style-type: none"> • Created an interdisciplinary database of women scientists from Central Europe and promoted awareness of this database among national and international organisations, industrial bodies and R&D employment sites. • Developed an information flyer and held a workshop for women to inform and mobilise them to register in the European Commission database of expert evaluators. • Developed training tools and workshops dedicated to addressing the issue of gender bias in science. <p>Empowering scientists and reaching for scientific excellence by building capacity and skills:</p> <ul style="list-style-type: none"> • Developed a Project Sourcebook which introduces the European Commission research funding tools and offers experience-based tips and suggestions on proposal writing and project coordination and management. • CEC-WYS partners have fostered reflective practices among scientists by developing a manual on the inclusion of gender dimension in research questions and methodology and organised workshops to introduce the concept and look at concrete examples of how this can be done. • CEC-WYS partners held seminars for young men and women scientists, aiming to prepare young researchers to take ownership of their research projects, and to develop skills in communication and responsible conduct of science, and provide them with skills to enable them to develop into effective supervisors and mentors, based on the Reflexives programme. • Developed a career resource website to orientate and guide researchers beginning their research careers, and those scientists who would like to expand their research horizons beyond their national funding opportunities. • CEC-WYS's activities to encourage women into decision-making positions are aimed to help women realise their ambitions and potential. This is an important step towards encouraging equality and recognition of the importance of women's contribution to the scientific community. <p>Contributing to policy development:</p> <ul style="list-style-type: none"> • Based on the Enwise expert group recommendations concerning the position of women in science in Central and Eastern Europe, CEC-WYS partners monitored policy developments by conducting a mapping exercise and writing national reports and a comparative international report with which to lobby at national level. • CEC-WYS conducted the Enwise Workshop on Young Scientists, wrote a workshop report, Nurturing or Frustrating Ambition? and analysed a follow-up online questionnaire on early career stage researchers' perceptions of the issues they face. Results have been made publicly available and we aim to synergise with the activities of other organisations concerned with young scientists as a tool to lobby for policy development.
Outputs	<p>Various publications, reports, workshops, seminars, information sources, database, career resource website</p>
Intended outcomes, effect	<ul style="list-style-type: none"> • Empowered women and young scientists will be able to name the obstacles they face, and therefore will be more confident to advocate for their interests at institutional level. • Scientists better equipped with reflective skills and an understanding of the gender implications of their research will be more able to reach to excellence in their scientific research and be more effective supervisors. • Individual empowerment and reflective practice will contribute to changing research cultures. • The concerns of young scientists and women scientists will reach institutional and national policy agendas. • Mobilisation will facilitate the democratisation of decision-making in science and the development of a meritocracy in the scientific

	community.
Evaluation	Project finished in February 2007 but there are many useful resources for scientists available online. N/A
Sources/references	http://www.cec-wys.org/html/

3. Centre of Excellence Women in Science (CEWS)	
Country/region	Germany based – but serves all of Europe
Level of intervention	International, national, institutional – policy influencing and implementation
Who is driving it?	Industry, academia, with public support
Sector focus	S&T – all disciplines
Target group	Women scientists, decision-making persons at universities/research institutes/area of industrial research, gender experts, science administration. The individual women scientists themselves head this list. They are offered a large scope of training measures, individual advisory service, database access, networking opportunities, and comprehensive electronically retrievable information. They also work as advisors for decision-making persons at universities, research institutes, and in the area of industrial research. This function includes both the interdisciplinary strategy development and the conceptual advisory with regard to the equal opportunity political measures and the scientific evaluation of programmes which have already been implemented. They also support the work of commissioners for the advancement of women and equal opportunities and the activities of researchers around gender studies. CEWS provides these gender experts with wide range of information and competent advice. Last but not least, the offered services are requested by members of the science administration. They evaluate, for example, the funding practices of individual institutes, advise scientific organisations with regard to gender mainstreaming or implement interdisciplinary studies to identify political demand for action.
Type of initiative	<ul style="list-style-type: none"> • Knowledge and research-based service institute • Awareness, equal opportunities, access, participation, reconciling professional and private life, reward, retention
Description of initiative	The national node for the realisation of equal opportunities for women and men in the area of science and research in Germany. CEWS serves as think tank for this field of policy, stimulates thinking, initiates alteration processes for which it provides scientific support, and actively co-organises the required transfer processes between science and politics. The German science system must exploit and utilise the existing potential of highly skilled scientists for the upholding and development of excellence in higher education, training and research in this country. The scope of activities is international. They implement German and EU projects both on an independent basis and in cooperation with other partners, and furthermore network best practice measures for the enforcement of equal opportunities on a high level. As a knowledge and research-based service institute, CEWS services are available to scientists, universities, research groups, scientific organisations, and political panels.
Activities	Women Scientists: Customised programmes provide worldwide support to women scientists from all disciplines and thus assist them in improving their career prospects within the scientific system. In the first place, this service is utilised by highly-qualified women in the field of training and research, i.e., by post-graduates or women professors. They take advantage of individual advice regarding advancement opportunities, and participate in application trainings to improve their chances for a professorship appointment. In addition, the scientists can access the extensive CEWS information pool. This information pool includes the electronic

	<p>newsletter, portals, databases, and an event calendar. The members of appointment commissions make use of the FemConsult database of women scientists to search online for potential professorship applicants, etc.; registration in this database is free of charge.</p> <p>Gender Experts: CEWS offers commissioners for the advancement of women and equal opportunities a broad scope of services. They can search the FemConsult women scientist database for suitable professorship applicants, subscribe to the newsletter that delivers the current news or draw on advice regarding an application for the Total E-Quality Award. The university ranking on the basis of gender equality indicators also provides important impulses for this target group. CEWS supplies a number of relevant resources for the scientific activities of women's affairs and gender researchers. This includes for example, the online literature database where they can search for contributions to the topic of women in science and research, the FemProject database containing information on women and gender research projects. Another central task of CEWS is the edition and organisation of empirical findings and current information relating to this area of research, and their provision for interested persons. Finally, CEWS identifies specific research requirements on a secured scientific basis so that research will be taken up and appropriate solutions may be developed.</p> <p>Management Staff Universities: Women currently hold only 12% of professorships. The federal government plans to increase this share to 20% in the medium term. The career step into a professorship is considered a particularly critical bottleneck. With our offers for the university management, we are aiming at eliminating gender-specific barriers in the selection process. This target group intensely utilises the FemConsult women scientist database to search for qualified applicants. Moreover, they consult for executive university administration staff in the framework of the application for the Total E-Quality Award. On the basis of a continuous biennial university ranking on the basis of gender equality indicators programme, they show managers the current equal opportunity related rank of their university as compared to other German universities. CEWS recently published a gender guide leaflet for the accreditation process. On request, CEWS will also offer gender mainstreaming consulting, where top down strategies are developed, innovative equal opportunity related instruments are drawn up, and existing measures are evaluated. This advisory work shall help to anchor the subject of equal opportunities in science in the spirit of gender mainstreaming as an action principle of the decision makers from the field of training and research and to competently support alteration processes.</p> <p>Science Administration – Organisations: CEWS stays in steady and active contact with scientific organisations, for example the Hochschulrektorenkonferenz HRK (German Rectors' Conference), the Wissenschaftsrat WR (Council of Science), the Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung BLK (Bund-Länder Commission for Educational Planning and Research), the Deutschen Forschungsgemeinschaft DFG (German Research Foundation), the Stifterverband für die Deutsche Wissenschaft (Donors' Association for the Promotion of Science and Humanities in Germany), or the Centrum für Hochschulentwicklung CHE (Center for the organisational development of institutes of higher education) and - as an advising institute - provides support for questions about equal opportunities in the scientific discourse. The cooperation with these organisations takes place in individual cases during the preparation of events and publications.</p> <p>Services include: transfer of knowledge, advice and training, networking, strategy and concept development, evaluation and benchmarking.</p>
Outputs	Various databases, online resources, training programmes, manuals, etc
Intended outcomes, effect	<ul style="list-style-type: none"> • Equal opportunities for women and men in the area of science and research in Germany • Utilisation of the existing potential of highly skilled scientists for the upholding and development of excellence in higher education, training and research in Germany
Evaluation	Various available – independent projects – for own and other projects

Sources/references	http://www.cews.org/cews/en/
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3.a. European Platform of Women Scientists (EPWS)	
Country/region	Europe (located in Brussels)
Level of intervention	National – influencing policy, regional – Europe
Who is driving it?	European Commission and academia
Sector focus	S&T
Target group	European women scientists
Type of initiative	Networking - for purpose of empowering women scientists to participate in the policy debate and thereby enhancing their professional and career advancement
Description of initiative	The purpose of having the EPWS is to build a structural link between women scientists and research policy makers. The aim is to introduce a new key strategic actor into the research policy debate by making the voice of women scientists heard. Supports the work of a whole range of existing national, European and international networks of women scientists from all disciplines (natural, medical and social sciences, engineering and technology, the humanities and arts). Furthermore, the platform aims to make women scientists better understand the role they can play in the research policy debate and how to fully benefit from these opportunities by bundling their powers and forces.
Activities	<ul style="list-style-type: none"> • Networking • Profiling and advocacy • Lobbying
Outputs	Networking links and opportunities, profiles, meetings
Intended outcomes, effect	Women scientists taking part in policy debate Women scientists enhanced professional and career advancement
Evaluation	N/A
Sources/references	http://www.epws.org/index.php

3b. Career Strategies for Women in Science	
Country/region	Europe
Level of intervention	Institutional – implementation
Who is driving it?	Industry and Academia Centre of Excellence Women in Science (CEWS)
Sector focus	HE
Target group	Top qualified women scientists
Type of initiative	<ul style="list-style-type: none"> • Training seminar • Professional and career development
Description of initiative	In 2001, CEWS elaborated the programme parallel to the service regulations reform and the Equal Opportunities in the University and Science Programme(HWP), which has been implemented since late 2001 in the framework of a public-private partnership in cooperation with L'OREAL Deutschland. The training seminars for top qualified women scientists performed within this programme shall vigorously increase the share of women in the staffing of professorships and junior professorships. The federal government has planned to achieve a 20% share of women professors by 2005; the above promotion instrument shall – amongst other things – be applied for the realisation of this objective.
Activities	<ul style="list-style-type: none"> • Seminars • Coaching
Outputs	By the end of 2003, 706 top qualified women scientists had been trained within 52 three-day seminars and a subsequent coaching possibility.
Intended outcomes, effect	Increase the share of women in the staffing of professorships and junior professorships

Evaluation	<p>CEWS has already completed the evaluation of the programme; the analysis of the first 310 questionnaires confirms the programme concept, which was appropriately modified within the framework of the process control; 69% of the respondents would unconditionally recommend other women scientists in similar situations to participate in the seminar, 28% would do so conditionally. Two thirds of the women scientists who participated in the programme fulfill the requirements for a university or technical college professorship; one third had finished their PhD. This ratio corresponds to the promotion policy of the last decade, which primarily concentrated on the qualification for professorships; it certainly achieved the targeted potential. The participants' scale of subjects can almost equally be distributed among the two large subdivisions humanities and social science (52%) and natural science (48%). The participants mainly come from the university field (64%), secondarily from the field of external research (17%) or other activities (19%).</p> <p>Full report available online.</p>
Sources/references	http://www.cews.org/cews/en/

4. TWOWS (Third world Organisation for Women in Science) – now OWSD (Organisation for Women in Science for the Developing World)	
Country/region	Based at the offices of the Academy of Sciences for the Developing World in Trieste, Italy
Level of intervention	Implementation, international
Who is driving it?	Industry and academia
Sector focus	S&T general
Target group	<ul style="list-style-type: none"> • Young women scientists working and living in Third World countries • Women entering scientific careers, established female scientists
Type of initiative	<ul style="list-style-type: none"> • An independent, non-profit and non-governmental organisation • Access to field, participation – promote and monitor, networking and collaboration, reward and recognition, increase productivity
Description of initiative	<p>TWOWS is the first international forum to unite eminent women scientists from the South with the objective of strengthening their role in the development process and promoting their representation in scientific and technological leadership.</p> <p>Objectives:</p> <ul style="list-style-type: none"> • Strengthen research efforts and training opportunities of young women scientists working and living in Third World countries • Survey and analyse the status and prospects of women in science and technology in the Third World • Promote the recognition of the scientific and technological achievements of women • Improve the access to educational and training opportunities for women in science and technology • Increase the scientific productivity and efficiency of women scientists in the Third World • Promote collaboration and communication among women scientists and technologists in the Third World and with the international scientific community as a whole • Encourage other international organisations to increase their activities concerned with promoting the role of women in science and technology in the Third World.
Activities	<p>Postgraduate Training Fellowships</p> <p>Postgraduate Training Fellowships for Women Scientists from sub-Saharan Africa and Least Developed Countries (LDC) at centres of excellence in the South. The Fellowship is offered to women scientists to pursue postgraduate research in the following fields of basic sciences: biology, chemistry, mathematics and physics.</p>

	<p>Inventory of Women Scientists and Organisations</p> <p>Within this programme, TWOWS has completed the first stage of comprehensive computerised inventories of active Third World women scientists and technologists and of organisations concerned with the promotion of women in science and technology. Appropriate software will be used to make these inventories useful to regional, national, and international organisations concerned with science and development in the South.</p> <p>Women Leaders in the South</p> <p>The publication "Science, Women and the Developing World" aims to highlight the significant influence of women scientists in key positions and how they have affected science and technology issues internationally.</p>
Outputs	<ul style="list-style-type: none"> • Through its Postgraduate Training Fellowship programme, TWOWS has so far helped many young women students to earn their degrees. • Inventory of women scientists and organisations • Publication: Science, Women and the Developing World
Intended outcomes, effect	<ul style="list-style-type: none"> • Increased training opportunities of young women scientists working and living in Third World countries • Recognition of the scientific and technological achievements of women • Increased scientific productivity and efficiency of women scientists in the Third World • Increased collaboration and communication among women scientists and technologists in the Third World and with the international scientific community as a whole.
Evaluation	N/A
Sources/references	http://www.ictp.trieste.it/

5. European Association for Women in Science, Engineering and Technology (WiTEC)	
Country/region	Europe
Level of intervention	International, national and regional
Who is driving it?	Industry, academia, associations
Sector focus	SET
Target group	Girls and women studying SET, policy makers
Type of initiative	Networking and information exchange, increase access and participation, skills development, research and advocacy on gender barriers, gender mainstreaming
Description of initiative	<p>WiTEC was formed as a network in 1988 and after more than ten years of networking and project activities related to women and SET, established itself as a non-profit European association in May 2001. WiTEC has the following aims at European level:</p> <ul style="list-style-type: none"> • To increase the number of girls and women studying SET subjects and to help them progress to related careers • To develop women's technical and entrepreneurial skills through training initiatives and projects • To create information exchanges and networking opportunities for women in SET • To promote and support research into areas relating to women in SET • To support initiatives to promote the Gender Mainstreaming Policy • To promote regional, national and international awareness and interest in SET <p>Currently there are 10 WiTEC national network co-coordinators based in Austria,</p>

	<p>Estonia, Germany, Greece, Hungary, Italy, The Netherlands, Spain, Sweden and the UK. The WiTEC Network has developed and managed a wide variety of projects relating to women and SET (Science, Engineering and Technology) with partners from across Europe over the many years it has been in existence.</p>
Activities	<p>Examples of projects:</p> <p>LOUPE: HTE (Higher Technical Education) faces two major problems: recruitment is decreasing and engineering studies are outdated. New concepts like problem-based learning, project education, redesigning of the curriculum and the powerful learning environment have been introduced in HTE. But all these innovations lack a gender perspective. There is a need for hands-on materials (real life cases, projects, problems) and other forms of (knowledge) input into technology education that comes from actual practice. The material has to meet a number of prerequisites in order to be considered suitable for the current (redesigned) education and it has to be attractive to both groups of students (women as well as men). This requires a new way of identifying, assessing and describing cases/projects, and a new way of communication with the business community. To achieve this, the LOUPE project will research and collate case studies to provide students in technical education with a better insight into working life. This methodology in turn will improve communication and partnership between Education and Industry.</p> <p>PREFACE: The aim of the PREFACE project is to develop a European training programme specifically targeted at female students in the SET field. The project will present the idea of entrepreneurship to young women while they are studying, in order to make them familiar with the concept of entrepreneurship and to interest, motivate and encourage them to set up their own business in the field of their studies upon graduation. An additional important target group is that of the university teachers who will be made more aware of the gender dimension and adopt new teaching methodologies through their involvement in the project. Digital training material where students can test their own entrepreneurial skills will also be developed and tested. Countries involved include Denmark, Germany, Estonia, Spain, Finland, Greece, Italy, Netherlands, Sweden, United Kingdom and Switzerland.</p> <p>Conference on Senior Women's Visibility in SET across Europe: The WiTEC conference provided the opportunity to bring together many key players concerned with the under-representation of senior women on committees and panels in SET across Europe and stimulated new debate on this important topic. Workshops were held on women inventors and on the benefits of mentoring for women in SET.</p> <p>Improve: The aim of the IMPROVE project was to develop best practice guidelines for companies. The handbook covers the preparation and development of training programmes for female trainees, studying within the fields of science, engineering and technology. The guidelines provide tools for host organisations to use when planning a trainee placement in a male-dominated sector, and checklists for companies to ensure equal opportunities practices are being adhered to in their organisations. Countries involved were Sweden, Czech Republic, United Kingdom and Italy. A booklet was also published containing best practice guidelines.</p> <p>JASS Research: The main aim of the JASS Research was to gain a greater understanding of the ideal conditions for women to set up their own businesses in SET. Women who had successfully established their own business in SET completed questionnaires to provide information regarding the conditions they felt necessary to start up in business and to highlight any barriers they had faced. In addition, women students in SET completed questionnaires to gauge their interest in setting up in business following their course. The project investigated the reasons why fewer women decide to establish their own business in non-traditional fields of employment. The results of the project formed a report which is used to help improve the self-employment prospects for women entrepreneurs by providing information and advice on good practice. Countries involved were Germany, United Kingdom, Belgium, Spain, Netherlands and Sweden.</p> <p>Student Placement Programmes for Women: Several WiTEC Co-coordinators</p>

	<p>across Europe have worked on Student placement programmes for women in SET, providing grants for female undergraduates, postgraduates and recent graduates who want to gain work experience in a scientific, technological or engineering field in Europe. WiTEC informs students about placement vacancies in Europe, allocates grants and monitors students whilst on placement. Student placement programmes have proved to be successful in providing females with practical work experience in a SET industry which gives many the confidence to take up employment in SET upon finishing their studies.</p> <p>Tackling Stereotypes: The aim of Tackling Stereotypes is to analyse on a European level the barriers that women encounter in their promotion and professional development in the field of science and technology, and to propose actions aimed at removing them. The project is led by members of the network European Women in Science, Engineering and Technology (WiTEC), with the participation of institutions in Austria, Estonia, Germany, Greece, Hungary, Spain, Sweden, The Netherlands and The United Kingdom. This Final conference presents the results and outcomes obtained in the framework of the projects. Cases of good practices and personal experiences will be presented in order to promote a reflection and debate on the topic. The conference is aimed at all persons interested from both the academic world and the business world.</p>
Outputs	National networks, research reports, training programmes, conference papers, best-practice guidelines, handbooks, student placements, grants.
Intended outcomes, effect	<ul style="list-style-type: none"> • Increase in the number of girls and women studying SET subjects • Development of women's technical and entrepreneurial skills • Information exchange • Networking opportunities for women in SET • Research into areas relating to women in SET • Promotion of gender mainstreaming • Increased awareness and interest in SET
Evaluation	Completed projects – available online
Sources/references	http://www.witec-eu.net/

6. European Network of Mentoring Programmes (Eument-net)	
Country/region	Europe
Level of intervention	Regional, national
Who is driving it?	Public sector, academia, funding organisation
Sector focus	Academia and research
Target group	Organisations running mentoring programmes
Type of initiative	Networking
Description of initiative	Eument-net is a network of mentoring programmes promoting women's careers in academia and research. It fosters the exchange of experience and best practice among mentoring programmes; promotes quality standards and highlights the role of mentoring for the promotion of gender equality; supports the transfer of knowledge and expertise; facilitates cooperation among programmes and the promotion of new mentoring activities; aims to put mentoring for women in

	<p>academia and research on science policy agendas.</p> <p>In 2007, eument-net started as a project supported by FP6, a consortium of five partners from Austria, Bulgaria, Germany and Switzerland. Since October 2008, eument-net is legally established as an association, open to new members.</p>
Activities	<ul style="list-style-type: none"> • Access to a European network of mentoring programmes with shared standards • Contacts with a broad range of mentoring programmes from various countries and international programmes • Possibility to disseminate and benefit from best practice examples • Possibility to organise, contribute and participate in workshops and conferences • Contacts to find partners for international projects related to mentoring • Participation in cooperation schemes, such as the Short Term International Mentoring Exchange (STIME) • Free copies or preferential fees for eument-net publications • Possibility to issue publications on mentoring
Outputs	Research results, publications, workshops, conferences, networking
Intended outcomes, effect	<ul style="list-style-type: none"> • Highlight the role of mentoring as a tool for the promotion of gender equality and women's careers • Foster exchange of experience and best practice among mentoring programmes • Define quality standards and facilitate continuous improvement of programmes • Facilitate cooperation among programmes and the promotion of new mentoring services and activities • Support knowledge transfer on national and European levels, especially to countries where mentoring is as yet little known.
Evaluation	N/A
Sources/references	http://www.eument-net.eu/default.aspx

7. Dialogue and Action for Gender Equality & Research Excellence in European Science – women in science (genSET)	
Country/region	Europe
Level of intervention	Regional
Who is driving it?	European Commission, Science institutions
Sector focus	Science
Target group	Science leaders, gender experts, stakeholder scientific institutions, and science strategy decisionmakers
Type of initiative	Forum, network
Description of initiative	<p>genSET is a project funded by the European Commission's 7th Framework Programme under Science & Society. It runs from September 2009 to February 2012. It is delivered by a consortium of four partners and supported by a network of leading pan-European science institutions as patrons. genSET creates a forum for sustainable dialogue between science leaders, gender experts, stakeholder scientific institutions, and science strategy decisionmakers. It has five priority focus areas, where gender inequalities and biases disadvantage women's participation in science. genSET improves individual and collective capacity for action to increase women's participation in science.</p>
Activities	It develops practical ways to incorporate gender knowledge and gender

	<p>mainstreaming expertise into European science institutions. These activities include innovative Consensus Seminars of gender experts and European science leaders; Capacity Building Workshops for over 100 scientific institutions; and Valorisation Symposia engaging scientists and decision makers at national level.</p> <p>Between March and June 2010, three genSET Consensus Seminars brought together 14 European science leaders to share knowledge and experience and arrive at a consensus view on the gender dimension in science and on the priorities for gender mainstreaming action in scientific institutions. The question How European Science Can Benefit from Integrated Action on Gender framed the deliberations on the gender dimension, with a specific focus on bringing about greater equality of opportunity and treatment in recruitment and advancement of women and men scientists, and in assessment of their performance and work; and incorporating gender and sex in the research process, in science knowledge production, and in the science value system to improve quality and excellence of scientific endeavours. The genSET Consensus Seminars adapted the format of the traditional Consensus Conference process, putting the science leaders in the role of a 'lay panel' meant to reach consensus with the help of gender researchers as 'experts' and science stakeholder institutions as their 'public.' The consensus recommendations developed by the Science Leaders Panel, call for action in four areas of the gender dimension in science: science knowledge making, deployment of human capital, institutional practices and processes, and regulation and compliance with gender-related processes and practices.</p> <p>The Capacity Building Workshops are the second step of the development of dialogue within genSET. In each of the three workshops, 25-30 stakeholder organisations will work with 5-10 gender experts in a participatory process that builds on the recommendations of the Consensus Report and construct or improve institutional gender action plans. The workshops will build on the consensus report, Recommendations for Action on the Gender Dimension in Science, and draw upon the extensive expertise of gender experts facilitating. After each workshop five stakeholders will receive additional six days of one-on-one consultation with a gender expert. The procedures of each workshop are meant to maximise the capacity of the participating organisations to institutionally integrate gender within their organisations. After each workshop five stakeholders will receive additional six days of one-on-one consultation with a gender expert. The procedures of each workshop are meant to maximise the capacity of the participating organisations to institutionally integrate gender within their organisation.</p>
Outputs	Seminars, reports, networking opportunities, information dissemination, capacity building workshops
Intended outcomes, effect	Increased individual and collective capacity for action to increase women's participation in science
Evaluation	Ongoing

Sources/references	http://www.genderinscience.org/index.html
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8. Gender Debate in the European Research Area (GENDERA)	
Country/region	Europe
Level of intervention	Regional
Who is driving it?	European Commission: The GENDERA consortium consists of nine partners from nine European countries: Austria, Germany, Greece, Hungary, Israel, Italy, Slovakia, Slovenia and Spain. It is coordinated by Tudományos és Technológiai Alapítvány from Hungary.
Sector focus	Women in Science
Target group	Policy and decisionmakers
Type of initiative	Network, information collection and dissemination, policy reform
Description of initiative	<p>From 2010-2012, the partners in the GENDERA initiative will strive to make a change to the balance of gender in research organisations in Europe. By raising awareness in a wide cross-section of today's society, GENDERA aims to re-address the balance of gender within research organisations and higher education organisations across Europe. The role of women in specific disciplines and in decision-making positions will be strengthened through dialogue (the gender debate) and the implementation of best practices. From 2010 onwards, the GENDERA partners will collect, systemise and analyse existing policies and programmes in order to identify good practices that are already having a positive effect on ensuring that women get higher in research organisations and higher education institutions and achieve decision-making positions. GENDERA is a pilot initiative with an interdisciplinary cross section of partners from policy makers in science and research, human resources experts, sociologists, experienced scientists (men and women) and business consultants committed to boosting gender equality in scientific research.</p>
Activities	<p>National Task Forces: Each GENDERA member country will gather experts from decision-making organisations, research and technology organisations and other stakeholders. Task forces will be created, which will meet at national or international level (infrequently) during the project's duration.</p> <p>Good Practices: From January to June 2010, the project partners have collected and analysed good practices from each of the participating countries. All the good practices have contributed or are contributing to raising the number of women researchers achieving higher and decision-making positions in research organisations and higher education institutions. The 60 case studies featured as good practices are exemplary of the programmes being implemented throughout Europe.</p> <p>GENDERA Final Conference: The GENDERA Final Conference will take place in Stuttgart, Germany from 19th - 20th March 2012</p>

	The International GENDERA Roundtable "Gender and Research Funding" took place in Bratislava on Tuesday, 18th May 2010. Fifty-five participants from eight countries attended the workshop, which addressed the problem of gender equality measures and practices used or not used by funding organisations.
Outputs	National Task Forces, Roundtable discussions, publications, database and case-studies of best practices
Intended outcomes, effect	The role of women in specific disciplines and in decision-making positions will be strengthened through dialogue (the gender debate) and the implementation of best practices.
Evaluation	N/A
Sources/references	http://www.gendera.eu/index.php5?file=2

9. SET-Routes	
Country/region	Europe
Level of intervention	Regional
Who is driving it?	Europe Commission, the European Molecular Biology Laboratory (EMBL), the European Molecular Biology Organisation (EMBO), and the European Laboratory for Particle Physics (CERN). SET-Routes is funded by the European Commission under FP6
Sector focus	Bioinformatics, particle physics, space science, robotics, molecular medicine
Target group	Young girls, PhD students & institute directors
Type of initiative	Network
Description of initiative	SET-Routes is a pan-European network of women scientists from PhD students to institute directors, working in some of the most challenging areas of science: bioinformatics, particle physics, space science, robotics and molecular medicine. The goal is to awaken young girls' interest in science and to encourage young women graduates to pursue careers in science, engineering and technology – SET. They aim to tackle the problem of under-representation of women in science by challenging old and outdated perceptions about the "typical scientist" and making traditionally male-dominated fields of study more attractive to women.
Activities	<p>SET-Routes combines four initiatives:</p> <ul style="list-style-type: none"> • The Way Forward – an international Women in Science Conference • School Ambassadors (Our ambassadors are young women who have successful careers in different fields of science from biology to medical imaging and physics to robotics. They will visit schools in Europe and share their experience of career and life. They will give an idea of the type of opportunities and careers that are out there, talk about exciting developments in SET and how they contribute to the high-tech world we live in.) • University Ambassadors (SET-Routes University Ambassadors are top women scientists who will share their experience of working in science with undergraduates and post-doctoral students. They will present a clear and realistic picture of the opportunities for women in SET in Europe, through first-hand experience of working at all levels of the science career ladder, within a variety of jobs: academia, industry and science-related.) • Insight Lectures - The SET-Routes Insight Lectures are a series of interactive scientific lectures for use in schools. Presented by exceptional women scientists who have contributed to the series between 2007 and

	2009, the lectures introduce the exciting world of Science, Engineering and Technology (SET), covering fields as diverse as space science, climate change, genetic counseling, haemochromatosis and DNA chips, malaria - a world disease, stem cells and regeneration, archaeology of the universe, and cosmology. The speakers from all walks of science talk to young audiences about their experiences as scientists. They discuss how they came to work in their field, what they have discovered and what impact their results have on our daily lives, as well as outlining some of their more personal experiences as female scientists.
Outputs	Conference proceedings and publications, school and university ambassadors, information sharing and dissemination
Intended outcomes, effect	Young girls interested in science, young women graduates pursuing careers in SET, gender and sector stereotypes transformed
Evaluation	N/A
Sources/references	http://www.set-routes.org/about/index.html

10. Practising Gender Equality in Science (PRAGES)	
Country/region	Europe
Level of intervention	Regional
Who is driving it?	European Commission
Sector focus	Science
Target group	Policy and decisionmakers
Type of initiative	Research and dissemination project
Description of initiative	<p>PRAGES consists of an action of coordination, lasting 21 months (2008-2009), aimed at comparing the various strategies implemented for promoting the presence of women in decision-making positions relating to scientific research in public institutions. It pursues the objective of collecting, classifying and evaluating good practices and positive actions (involving those where a positive contribution from men is recorded) that can be found in OECD countries, both at the national level and at the level of the individual institutions, and to make them available, in a usable form, to a number of selected targets, including both decisionmakers and other relevant stakeholders.</p> <p>It is characterised by four particular elements:</p> <ul style="list-style-type: none"> • The attempt to integrate the most important and relevant results deriving from the studies and good practices relating to the fight against vertical segregation in various professional, political and social areas • Enhancing the understanding of the exclusion of women as being deeply linked to what may be called the lack of socialisation of gender in science, that is, the resistance of scientific community to recognise and manage social and gender dynamics that drive the production of scientific research and its assessment • The comparative approach, from a geographical point of view, with the inclusion of 11 partners coming from six countries (both European and non-European, including, in particular, the United States and Australia) • The orientation to benchmarking, above all in order to concretise the indications in terms of policy-making.
Activities	Research study and information dissemination
Outputs	<ul style="list-style-type: none"> • Guidelines for Gender Equality: The guidelines are based on a complex work of collection and assessment of practices developed in Europe, North America and Australia, resulting in a database of gender equality programmes in science and technology. The guidelines will be useful for universities, research centres and other stakeholders to implement a new

	<p>institutional cultural change for a greater inclusiveness of women scientists, and the improvement of the working conditions of women (and men) on their premises.</p> <ul style="list-style-type: none"> • Good Practice Database: The database contains information on 109 programmes for the promotion of women in decision-making positions in science and technology sectors. • Synthesis document on the good practices database:
Intended outcomes, effect	Awareness of good guidelines and practices to ensure gender equality at all levels in science
Evaluation	Final documents as indicated
Sources/references	http://www.retepariopportunita.it/defaultdesktop.aspx?page=2749

11. Empowering Women Engineers Careers in Industrial and Academic Research (PROMETEA)	
Country/region	Europe (EU 15)
Level of intervention	Regional and national
Who is driving it?	Academia and industry
Sector focus	Engineering
Target group	Funding bodies, engineering societies, policy and decisionmakers
Type of initiative	Research study and information dissemination
Description of initiative	<p>The aim of PROMETEA is to develop a better understanding of gender issues in engineering and technology research settings, in order to propose effective measures and recommendations to empower women engineer's careers in academic and industrial research in Europe. A technological and economical sustainable development depends on the ability to promote a diverse and creative research sector, which is a key issue both in the European and in national research policies. The results will inform the funding bodies, scientific and technological societies, industrial R&D departments and other stakeholders towards greater gender awareness and fairness in recognizing scientific excellence in engineering and technology.</p> <p>Goals:</p> <ul style="list-style-type: none"> • To explore the gender dynamics of male and female careers in different engineering organisations: to compare different fields of engineering; to compare academic and industrial settings; to compare private and public organisations; and to compare innovative and traditional companies and organisations • To explore the effect of organisational cultures on male and female careers in different engineering organisations: differential effects of supportive cultures (motivating factors and influences operating within engineering organisations); differential effects of negative cultures (influential factors against gender equality within engineering organisations); and identification of different barriers to developing a successful career for men and women • To explore the assessment and measures of excellence in engineering and technology research and the impact on male and female careers: to compare different arenas of recognizing excellence; to compare actors who assess and evaluate excellence; to compare success rates in research funding and awards; and to compare salaries, bonuses and research budgets • To identify and evaluate good practice in different organisations: to explore the factors that influence and motivate engineering organisations in order to design and implement measures of equality; and to explore the factors which influence the sustainability of effective equality actions over time

	<ul style="list-style-type: none"> To draw recommendations aimed at promoting gender equality, for male and female careers in national and European engineering organisations including academic, public and private organisations, and engineering technology research bodies.
Activities	<p>This project will combine existing knowledge with new in-depth pilot studies on women engineers career progression linked to qualitative research work on the experiences of both women and men working in engineering and technology research, using cross-comparison as a research strategy and a longitudinal perspective. It will bring new perspectives on engineering and technology research in itself, with a focus on:</p> <ul style="list-style-type: none"> Gender dynamics of male and female careers, Comparisons between different fields of engineering and their interrelations, Recruitment, full-time and part-time, survival curves and tenure, vertical segregation, pay gap, school to work transitions, work life balance, double careers patterns. Differential effect of organisational cultures on male and female careers. Recognition of excellence in engineering and technology research, impact on female and male careers: the gate-keepers and gate-keeping in research funding committees, women's and men's success rates in research funding, analysis of scientific publishing and publicity, patents, experiences of "excellent women" at the top of technological research, prizes and awards in technology and engineering. Identification and evaluation of good practice.
Outputs	Research report and recommendations
Intended outcomes, effect	Better understanding of gender dynamics in engineering, better understanding of assessment and measures of excellence in engineering research, good practice identification, recommendations for gender equality in national and European engineering organisations.
Evaluation	N/A
Sources/references	http://www.prometea.info/

12. Towards Women in Science and Technology (TWIST)

Country/region	Denmark, Netherlands, Italy, Sweden, Slovenia, Israel, UK, Ireland
Level of intervention	National, grassroots
Who is driving it?	European Commission, Science Centres and museums (public)
Sector focus	SET
Target group	Young people, teachers, parents, general public
Type of initiative	Awareness raising
Description of initiative	<p>TWIST is raising awareness about the role and representation of women in science through ambitious programmes and activities in science centres and museums. The project targets young people, their teachers and parents as well as the general public. It will focus on the outdated stereotypes and prejudices on societal roles for men and women and career paths.</p> <p>Uses science centres and museums to coordinate the project – most of them have the promotion of S&T as core – with a view that also include a gender dimension: Experimentarium (Denmark), Science Center NEMO (Netherlands), Fondazione IDIS-Città della Scienza (Italy), Teknikens Hus (Sweden), House of Experiments</p>

	(Slovenia), Bloomfield Science Museum (Israel), King's College (UK), Trinity College (Ireland), ASDO (Italy), Ecsite (Belgium), E-tica (Italy).
Activities	Activities organized will involve the creation of an exhibition in several European science centres, Ignite on-going discussions among citizens, interactive drama, teacher trainings, scientist speed-dating and much more. Notably a new national way of focusing on the gender theme in each country will be established via "Gender day".
Outputs	S&T exhibitions
Intended outcomes, effect	Increased awareness of possibilities for young girls and women to pursue a career in science, change in stereotypes
Evaluation	N/A
Sources/references	http://www.the-twist-project.eu/en/

**OTHER EUROPEAN
GERMANY**

13. Strategies for enforcing equal opportunities for women in education and research	
Country/region	Germany
Level of intervention	National – policy
Who is driving it?	Federal Ministry for Education and Research (Bundesministerium für Bildung und Forschung, BMBF), Government of Germany Public sector
Sector focus	SET general
Target group	Women in education and research in Germany: Women in the information society, women at higher education institutions as students, teachers and researchers; women in research institutions
Type of initiative	<ul style="list-style-type: none"> • Government programme • Policy development, funding to support women in SET strategies, access to all fields, access to decision and policy-making and senior positions
Description of initiative	<p>Key strategic areas are:</p> <ul style="list-style-type: none"> • Expanding the career spectrum of women and gender mainstreaming in vocational education and training • Women in the science system • Women in the information society • Start-ups by women
Activities	<p>Policy development, gender mainstreaming, funding</p> <p>Current activities being funded are:</p> <ul style="list-style-type: none"> • Funding of women's studies/gender studies in the fields of education, science and research; Activities promoting equal opportunities for women in science, research and technology; International Women's University "Technology and Culture"; • Women in the information society – improving education, employment and information opportunities – Women go online (national campaign to encourage women to use the Internet), competence centres, networks and databases; • Measures to improve women's opportunities for training and career development (including a pilot programme on initial and continuing vocational education in the skilled trades); and • Development and testing of effective strategies for achieving equal opportunities and promoting a new awareness (through competitions, Total E-Quality Award for universities and research establishments) <p>Institutions from the fields of education, research, science and business are eligible for funding. Support is given in the form of non-repayable grants towards staff and equipment expenditure on projects or in the form of a contract to meet a federal government need. The Ministry also offers funding to support women in SET strategies.</p> <p>Expanding the career spectrum for women and gender mainstreaming in vocational education and training:</p> <p>Girls' Day - Girls' Future Day: "Girls' Day - Girls' Future Day" takes place nationwide every year on the fourth Thursday in April. So far, more than 500 000 girls have taken advantage of this special day to find out more about jobs in the</p>

	<p>scientific and technical sector.</p> <p>"Joblab" career planning game: Joblab I and II are two multimedia planning games on CD Rom which give girl pupils an opportunity to consider their ideas about their careers and lives interactively. The users discover new career fields and can weigh up the respective advantages and disadvantages in simulation. The aim is to plan a life with plenty of prospects involving technically oriented professions of the future. Joblab I deals with training occupations, Joblab II with occupations which require a degree.</p> <p>Lizzynet: The "LizzyNet" Internet programme gives girl pupils, particularly pupils at secondary general schools (Hauptschule), the opportunity to become involved interactively and get to know new professions.</p> <p>Further training for women in IT professions to become IT trainers: Girls and young women need positive female role models if we are to overcome traditional role and career patterns. As female trainers are virtually non-existent, girls and young women only too rarely take up careers in the IT sector. This project is aimed at women who have a career in IT but so far have no teaching experience and who are working in companies in the field of IT which would like to introduce corresponding traineeships in the new IT professions.</p> <p>Women in the Science System:</p> <p>Center of Excellence Women and Science (CEWS): The Center of Excellence Women and Science (CEWS) is an internationally oriented information, service and coordination centre which contributes towards implementing equal opportunities for women in science and research. It serves as the national coordination, information and counselling agency for scientific and political establishments, institutions, women scientists and companies. Its aims are to increase the share of women in leading positions at universities and research institutions, to raise the efficiency of political measures aimed at equality and to introduce gender mainstreaming in all areas of science and research. The Femconsult database, which contains the data of 7 000 women scientists, is a central instrument for increasing the share of women in leading positions.</p> <p>Institutions of Higher Education</p> <p><i>A Springboard for Advancement:</i> The Springboard for Advancement project aims to increase the share of women in leading positions, particularly at institutions of higher education. The project provides special career and application training schemes to enable women scientists to make the best possible use of their career opportunities when applying for positions as junior or full professors or for leading positions in research establishments. Nationwide, approximately 1 000 participants have improved their career prospects in science and research by taking part in the training schemes. The range of activities is currently being financed by the German Association of Universities and put into practice by the Center of</p>
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	<p>Excellence Women and Science (CEWS).</p> <p>femtec.network - Career building for young female leaders in engineering and the sciences: A programme to promote the careers of particularly gifted women students in the natural sciences and engineering is being developed, tested and evaluated within the framework of the project. The BMBF is responsible for funding the steering and coordination parts of the overall project. The participants are taught interdisciplinary key skills within the framework of summer schools, they receive support in planning their careers, and individual contacts are established with the professional world. In addition, they have the support of an experienced senior female member of the partner company as mentor. The aim is to achieve equal opportunities in the promotion and networking of young female leaders in engineering and the technical sciences, thereby implementing gender mainstreaming and increasing the share of women in these fields. The results of the pilot scheme were presented to a wide specialist public at a conference in March 2006</p> <p>Total E-Quality Award: The Total E-Quality Award is intended as an instrument for comparing the quality of measures which have been introduced to achieve equality at higher education and research institutions. The Total E-Quality Award is intended to motivate the higher education and research institutions to integrate innovative forms of equal opportunities for women in their organisational processes.</p> <p>Research Institutions</p> <p>Peer Mentoring: Peer mentoring is a concept for promoting careers which is intended to increase the share of female leaders in non-university research institutions. It involves the self-organized networking and mutual support of highly qualified women with a doctorate on their way to top positions. Effective forms of organisation as well as financial and skills concepts for peer mentoring groups are being developed and tested in a two-year pilot scheme, which was launched in 2004. In addition, external counselling requirements are being determined. The results of the pilot phase are intended to trigger the further development of mentoring processes.</p> <p>Childcare facilities at research institutions: Implementing equality also means improving the framework conditions for reconciling a career in science and a family. Most institutionally funded institutions of the Max Planck Society, the Hermann von Helmholtz Association of National Research Centres (HGF), the German Research Association (DFG) and the Fraunhofer Society therefore offer their employees childcare facilities. The BMBF has made this possible by authorizing the provision of budget funds for childcare facilities on a cost neutral basis</p> <p>Women in the Information Society:</p> <p>Women go online: The aim of the joint initiative launched by the BMBF, the</p>
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	<p>Federal Employment Agency, Deutsche Telekom AG, the women's magazine Brigitte as well as the Technology - Diversity - Equal Opportunity Competence Center was to increase the share of women on the Internet. Free introductory courses to help women familiarise themselves with the Internet are being held in 30 towns and cities throughout Germany. Continuation courses help the women to gain experience in "surfing and searching" the Web.</p> <p>Lizzynet: The "LizzyNet" Internet programme gives girl pupils the opportunity to discover and make use of the Internet for themselves. Girls and young women can get to know new professions, set up their own homepage, write articles for the on-line magazine "LizzyPress", chat, discuss various issues and become actively involved in what is taking place on the Net.</p> <p>International Study Course in Computer Science for Women at Bremen University of Applied Sciences:</p> <p>This course aims to enhance women's career prospects and to increase the share of women taking technical and scientific studies. Furthermore, it is also intended to contribute towards developing international and inter-cultural skills. The course is organized by the Economics Department and is largely single-sex. Graduates gain a university of applied sciences Diplom degree in Computer Science.</p> <p>Further training for women in IT professions to become IT trainers: Girls and young women need positive female role models if we are to overcome traditional role and career patterns. As female trainers are virtually non-existent, girls and young women only too rarely take up careers in the IT sector. This project is aimed at women who already have a career in IT, but so far have had no teaching experience, and who are working in companies in the field of IT which would like to introduce corresponding traineeships in the new IT professions.</p>
Outputs	Various: career and application training schemes, training programmes, funding, events, computer and internet programmes and games, awards, peer mentoring, childcare facilities, opportunities for further studies
Intended outcomes, effect	Women present in all areas and at all levels of the science system, in particular in positions of leadership.
Evaluation	Some evaluations of individual projects
Sources/references	http://www.bmbf.de/en/474.php

14. Women in Science and Technology (Frauen in Naturwissenschaft und Technik NUT e.V.)	
Country/region	Germany
Level of intervention	National – policy influencing
Who is driving it?	Combination of women working as scientists in academia, industry and public service
Sector focus	Science and technology
Target group	Women scientists and technologists in Germany
Type of initiative	Non-profit organisation/Association – Lobbying group

	Promote women scientists, support women scientists
Description of initiative	<p>The registered association "NUT - Women in Science and Technology" has its origins in the nationwide congresses of women scientists and engineers held in Germany every year since 1975. The association was founded in 1988 to act as a continuous interest and lobbying group for women in science and technology.</p> <p>Tasks and goals of NUT are:</p> <ul style="list-style-type: none"> • To support women in science and technology • To promote the feminist critique of science • To advance the development of ecologically and socially sustainable alternatives in science and technology • To reduce the discrimination of women in science and technology • To raise the awareness for the situation of women in male-dominated professions • To enhance information exchange • To encourage interdisciplinary cooperation <p>Members of NUT are women working in science and technology, e.g. in Physics, Mathematics, Biology, Chemistry, Computer Sciences, Environmental Sciences, Geosciences, Agricultural Science or Mechanical Engineering. They study, are self-employed or work in public institutions or private companies.</p>
Activities	<p>Database, information-sharing</p> <p>Each year two to three general meetings are held in different towns in Germany, one of them is the annual congress of women scientists and engineers. The others are always combined with one-day conferences.</p>
Outputs	<ul style="list-style-type: none"> • Expert database: NUT can help to find experts for scientific and gender issues that are willing to give lectures, to participate in panel discussions etc. • Book series: Together with the Talheimer Verlag, NUT publishes feminist books by women in science and technology. • NUT Newsletter: Three times a year, a NUT newsletter informs about the activities of NUT, discusses topics of interest and provides all types of information to the NUT members.
Intended outcomes, effect	<ul style="list-style-type: none"> • Increase in the feminist critique of science • Reduction in the discrimination of women in science and technology • Increased awareness for the situation of women in male-dominated professions • To encourage interdisciplinary cooperation
Evaluation	N/A
Sources/references	http://www.nut.de/about.html#

15. Competence Center Technology-Diversity-Equal Chances	
Country/region	Germany
Level of intervention	National, institutional
Who is driving it?	Industry and academia
Sector focus	IT
Target group	Men and women in HE
Type of initiative	Equal opportunities, career development

Description of initiative	<p>The main objective of the non-profit organisation Competence Center Technology-Diversity-Equal Chances is to actively help shape Germany's path towards becoming an information- and knowledge-based society. The goals of the measures and projects of the organisation are to strengthen media literacy and increase Internet use; to foster new ways of thinking about career orientation and life planning; to promote equal opportunity and excellence in higher education, science and research. To this end, it develops and carries out a wide range of initiatives and projects that exploit the potential of women as well as men to make equal opportunity a reality in all spheres of society and work. The strategy of equal opportunity presupposes recognition of people's diversity, their varied biographies, lifestyles and capabilities and promotes the development of the potential and opportunities this diversity entails. The organisation has bundled its activities into three areas of expertise:</p> <ul style="list-style-type: none"> • Digital integration focuses on equal access to changed lifestyles and labour markets. • Training, further education and careers concentrates on gender-oriented vocational and life planning and the transition from school to work. • Higher education, science and research intensifies efforts to promote talented young women in relevant academic subjects and research.
Activities	<ul style="list-style-type: none"> • Target-group oriented project and campaign development, networking • Event and project management • Studies and expert opinions, consulting and benchmarking • Development of course and training concepts
Outputs	<p>Reference projects: Job-Chance-Internet. Women design Future, Excellence and Power in ICT, Women to Web, Gender Activities in Informatics Year, Gender Networking - Technology connects, Girls' Day - future prospects for girls, University Award - Get the Best - Nationwide training project for girls - idee_it - New Paths for Boys - Expanding Future Opportunities in Work and Family Life, Online-Year 50plus - Internet connects - ProICT - Promoting ICT to Female Students</p>
Intended outcomes, effect	<ul style="list-style-type: none"> • Germany becoming a more information- and knowledge-based society • Equal opportunities for men and women by recognising people's diversity: equal access to changed lifestyles and labour markets; talented young women being promoted in relevant academic subjects and research
Evaluation	N/A
Sources/references	http://www.job-chance-internet.de/vk06/profil

16. Conference of Equal Opportunities Officers at universities and academic institutions in Baden-Württemberg (LaKoG)	
Country/region	Germany
Level of intervention	Grass-root and institutional
Who is driving it?	Academia, government
Sector focus	Higher Education
Target group	Female researchers in HE

Type of initiative	Mentoring, support, equal opportunity lobbying and advocacy
Description of initiative	<p>LaKoG is an association of equal opportunities officers at research universities, universities of education, as well universities of art and design and universities of music and performing arts in Baden-Württemberg. According to the statutes, responsibilities of this association include:</p> <ul style="list-style-type: none"> • Information, coordination and support for equal opportunities officers at individual colleges • aParticipation in opinion making on matters of education and science • Generating public awareness for equal opportunities issues. <p>The foremost aims of the Conference are to reduce discrimination against women in academia and to avoid such discrimination in the future. Women are actively supported and encouraged to overcome existing obstacles and to aim at a career in science, research or business in spite of the lack of female role models.</p>
Activities	<p>The conference office organises the cooperation of equal opportunities officers at academic institutions in Baden-Württemberg. On the state level, it is the central contact point for the equal opportunities officers, students and researchers of these institutions. The conference has been very efficient in communicating with policy makers, ministries, and other associations. The commitment of the conference is evident in its decisions and resolutions, as well as in the promotional programmes it runs and has initiated, and its other activities. Core activities are:</p> <ul style="list-style-type: none"> • Encouraging women to take up an academic career and making their contributions visible • Supporting talented young women academics • Avoiding and reducing structural barriers and discriminatory structures faced by women in research and academia • Enforcing agreed equal opportunities goals and systems of incentives • Enhancing the compatibility of career and family (work life balance) • Promoting the interests of women scientists and students on a regional and national level <p>Example of one such core activity is Supporting talented young women academics which includes:</p> <p>Mu: Mentoring and Training is an acronym; the actual German word 'Mut' means 'courage'. It is a programme for the advancement of highly qualified female junior researchers in the state of Baden-Württemberg. Women aiming at a full professorship are supported in realising their skills and making more effective use of their career opportunities. The programme provides participants with the opportunity to establish supportive relationships with experienced researchers, to overcome structural barriers and to gain knowledge and experience in the academic field. The programme is designed for women with a post-doctoral lecture qualification (Privatdozentinnen), women in the stage of their post-doctoral lecture qualification (Habilitandinnen), junior professors, postdocs, and women working towards their PhD.</p>

	<p>Orientation Course: The participants draw up their personal profile based on their personal situation. Considering the profile of qualification for a professorship in their profession they develop aims for the mentoring relationship. Each participant determines the desired profile of her mentor and gets the opportunity to participate in a course, like for instance about procuring third-party funds. The organisational structures of universities will be examined more closely, and the basic principles of university law will be presented. The participants will have time to exchange experience and to establish personal contacts.</p> <p>Matching with a Mentor: In a mentoring relationship the mentor supports the mentee in gaining both discipline-related knowledge and a feel for the values and norms of the scientific community. For a mentee this support can be in detail: sharing the mentor's experience and knowledge; counseling for the development of the qualification profile; counseling in situations of professional orientation; opportunity to take over special tasks; access to and development of informal work relationships; active attention and encouragement. Establishing both a good personal relationship and a functioning working alliance between mentor and mentee is crucial. This part of the programme addresses especially junior scientists who want to exchange experience with a professional over a fixed period. The project leaders assume the matching with a suitable mentor on the basis of the requirement profile which the participant develops. The aim is to establish contact between distinguished professors and scientists from the same discipline, or from a different area. Mentors should be experienced personalities who are ready to give pro-active and constructive feedback to the mentee; support the mentee in developing strategies to reach her goals; help the mentee to realise her skills and develop them to their full potential; give advice for individual development. Once the contact is established, the role of the project management is to lead partners to an agreement on the duration of the mentoring relationship and to help them fix dates for meetings. Apart from this, the organisation is left to the partners. They should, however, come to an explicit agreement on the terms and aims of the mentoring relationship. The goals specified in this agreement may refer to issues like making a name for oneself in academia, sharing of knowledge, career planning and networking. Mentees may apply themselves or be suggested by other parties.</p> <p>The courses are offered as workshops. They are developed by the project leaders according to the topics desired by the participants, organised and accomplished together with experts and subject specialists. Contents of courses include: work and self-organisation, time management, profiling and appearance, rhetoric and communication, job application training, appointments, laws, rules and regulations, university law (structure and jurisdiction), committee work, budget law, procurement of third-party funds, labour law, personnel management, education and didactics, communication and motivation advancement, conflict management,</p>
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	establishment and use of networks.
Outputs	Networking and support, mentoring, training and professional development
Intended outcomes, effect	Well-informed and supported equal opportunities officers, increased public awareness of equal opportunities issues, reduced discrimination against women in academia
Evaluation	N/A
Sources/references	http://www.lakog.uni-stuttgart.de/en/menue_links/startpage/index.html

17. Integration Team – Human Resources, Gender and Diversity Management (IGaD) (RWTH Aachen)	
Country/region	Germany
Level of intervention	Institutional
Who is driving it?	Academia, government
Sector focus	HE
Target group	Policy and decision-making, female scientists working in HE
Type of initiative	Advocacy and lobbying, training, support, mentoring, awareness-raising
Description of initiative	<p>IGaD is the central stakeholder within the measure "Mobilising People" which is part of RWTH Aachen's Institutional Strategy set in the framework of the German Excellence Initiative. RWTH Aachen has been the first German university to establish a strong and sustainable structural framework for the realisation of a coherent gender and diversity strategy. The IGaD, which consists of a team of scientists from different disciplines, works in the areas of Human Resources and Organisational Development, Work Life Balance, Research and Teaching. Therefore its main objective is to contribute to the establishment of equality and diversity as fundamental principles at all levels of decision-making. The integration of Gender and Diversity perspectives stands for:</p> <ul style="list-style-type: none"> • The active and fair arrangement of upcoming change management processes at RWTH Aachen University • The ability to embrace change, challenges, innovation and new developments • The development of skills that will enable us to acknowledge, value and inspire people from diverse backgrounds • The implementation of a coherent human resources and organisational development concept regarding gender and diversity aspects. <p>Hence, the main function of the IGaD is to sensitise different stakeholders at the university for gender and diversity issues and to support, advise and accompany them in carrying out a human resources and organisational development strategy which integrates gender and diversity aspects. Hence the Integration Team contributes to the successful implementation of diversity and equality in teaching, science and administration.</p>
Activities	The Integration Team supports administrative and academic facilities at the university in the development of measures and projects with the aim to integrate Gender and Diversity aspects comprehensively on all levels at the university. The Integration Team does not offer standardised services based on fixed epistemological standards but rather pursues to constantly explore and broaden

	<p>the scientific fields of gender and diversity under new aspects.</p> <p>Overview of Key Activities:</p> <ul style="list-style-type: none"> • With its scientific background in the area of Gender and Diversity, the Integration Team is the first address for faculties and facilities of the university regarding questions of Gender and Diversity issues. • Evaluation and analysis of existing Gender and Diversity knowledge, competences, awareness and projects in teaching, science and administration bodies of the university. • Improvement of the management of existing activities and closing of identified gaps through the development of appropriate innovative programmes. • Development of a coherent Gender and Diversity concept to implement the People Policy which was formulated within the framework of the Excellence Initiative of RWTH Aachen. • Monitoring of several programmes at RWTH Aachen which are conducted within the realization of the pioneering People Policy. <p>Projects include:</p> <p>Work Life Balance: Work Life Balance in the context of a trendsetting human resources strategy, means the reconciliation of private and professional life. Both aspects mingle with each other in a constantly changing work and living environment. As an organisational strategy, work life balance pursues a balanced proportion of work and private life through professional measures and policies for the securement of work life balance. The focus lies on the development of general conditions for an improved reconciliation of work/study and family life. The Integration Team supports RWTH Aachen in its development towards a family-friendly university. Only family-friendly conditions and structures provide real equal opportunities for members of the university. RWTH Aachen University has set the goal to contribute to the improvement of the university culture which allows a successful reconciliation of work/study and family life for male and female employees and students. Flexibility and efficiency, intelligent work and study solutions and a positive leadership and teaching culture will be equally promoted as a human resources strategy which offers career models for women and men in consideration of their family engagements (see preamble of the agreement on objectives "audit family-friendly university"). In general, women are still the ones who have to decide between professional and family life or have to forego a career at all.</p> <p>Work and family audit: Since 2008, RWTH Aachen University has undergone the trend-setting certification process of the berufundfamilie gGmbH, an initiative of the Hertie Foundation, and was certified with the "work and family audit" in May 2009. The "work and family audit" is a management device for a family-friendly arrangement of work and study conditions at universities which will create real differences for all status groups at the university. More than 850 organisations as well as private and public institutions participate in the auditing process. Universities represent a proportion of 13% with 110 participating institutions. Next</p>
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	<p>to RWTH Aachen 14 other universities are certified as family-friendly in North-Rhine Westphalia. On June 17, 2009, the public certificate of the “work and family audit” was given to RWTH Aachen University in Berlin. The award-giving ceremony for the certificate holders was carried out by the patrons, former Federal Minister of Family, Seniors, Women and Youth Ursula von der Leyen and Undersecretary of State Dagmar Wöhrle of the Federal Ministry of Economics. The attainment of the certificate highlights the great accomplishments of RWTH Aachen University in the area of work life balance during the last years.</p> <p>RWTH Aachen wants to strengthen the integration of Gender and Diversity aspects in all areas of research. Accordingly the IGaD supports and advises faculties on how to consider relevant working areas and courses in their strategic planning and to consequently incorporate them in study and examination regulations. Furthermore numerous research projects are realised under the direction of Prof. Dr. Carmen Leicht-Scholten which provide new findings for the implementation and development of gender and diversity management in organisations.</p> <p>The IGaD actively facilitates the integration of aspects of Gender Studies in research and teaching. Therefore one of its main tasks is to contribute to the creation of a climate which promotes mutual exchange and open discussion within the faculties and other facilities of the university. In order to incorporate more gender aspects in research and science RWTH Aachen has awarded ten doctoral fellowships which are primarily located in the field of natural sciences and funded by the German Research Foundation in the framework of the German Excellence Initiative (Overview of the awarded gender fellowships).</p> <p>In the framework of the postdoc-qualification-programme at RWTH Aachen University, all faculties receive funding for a part-time position for the duration of 36 months in order to retain and promote a qualified female junior scientist. The fellowships support highly qualified female junior scientists in their career progression at RWTH Aachen University. The IGaD developed the concept for the grant of the fellowships which refers to the guidelines of the German Research Foundation. The programme is funded by the German Research Foundation in the framework of the German Excellence Initiative.</p> <p>Mentoring Programmes: The term mentoring describes the engagement of an experienced person (Mentor) who passes on valuable knowledge to a less experienced person (Mentee) in a personal relationship in order to strengthen and promote the professional and personal development of the mentee. All mentoring programmes of RWTH Aachen are based on training, workshop (e.g. career building, leadership seminars) and networking modules. RWTH Aachen University offers the classical version of one-to-one-mentoring: in this version one experienced mentor professionally and personally supports junior scientists. For</p>
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	<p>the period of one year the mentors advise, give feedback, support the mentees in the development of potentials, competencies and strategies and give impulses for the personal development. Furthermore, RWTH Aachen offers accompanying education modules (seminars, workshops, etc.) which are customised to the needs of the particular target group. All mentoring programmes comprise network modules in order to strengthen the network of the mentees in the scientific community. The mentors also have the opportunity to network. The joint objective of all mentoring programmes at RWTH Aachen is to individually support the mentees and to encourage them to pursue a scientific career. At the same time the programmes take the specific requirements of the different target groups into account.</p> <p>The project <i>TANDEMP/usIDEA</i> included the development, implementation and scientific evaluation of a human resources programme for female postdocs of natural sciences and engineering. The programme was funded by the 6th Framework Programme of the European Commission for a duration of three years (2007-2010). It was the first joint EU-project of the IDEA League (Imperial College London, TU Delft, ETH Zürich, RWTH Aachen and ParisTech), and the first international mentoring programme. Coordinated by RWTH Aachen, the project consortium realised an international mentoring scheme to support highly qualified female scientists of natural sciences and engineering to get prepared for a scientific career and a professorship in the participating countries. The programme was evaluated scientifically and lead to the development of a best practice-model of an international mentoring programme. The international conference “Going Diverse: Innovative Answers to Future Challenges – International Conference on Gender and Diversity in Science, Technology and Business” on 29-30 October 2009 was the final event of the project. It took place in Aachen and also constituted the conclusion of the first mentoring course. At this occasion the project coordination presented the evaluation results of the programme and set it in the context of human resources and organisational development. Another focus of the conference with around 170 participants was the exchange between gender and diversity experts from academia and companies. Besides the mentoring relationship with an internationally renowned male or female professor, the programme offered training in the form of Summer and Winter Schools on important career-related issues. Additionally, international networking events with prominent speakers offered the mentees the opportunity to socialise and consolidate their networks. The project partners took turns hosting the events.</p> <p>Objectives of the project were:</p> <ul style="list-style-type: none"> • Support of international female postdocs on their way to a professorship • International exchange and networking among high potentials • Insights into different scientific cultures and the international scientific community • Increase of the proportion of female professors • More gender equality at European universities.
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Outputs	Policy and management integration support, work-life balance audit, policy and practices; mentoring programme
Intended outcomes, effect	Establishment of equality and diversity as fundamental principles at all levels of decision-making. The integration of Gender and Diversity perspectives stands for: <ul style="list-style-type: none"> • The active and fair arrangement of upcoming change management processes at RWTH Aachen University • The ability to embrace change, challenges, innovation and new developments • The development of skills that will enable us to acknowledge, value and inspire people from diverse backgrounds • The implementation of a coherent human resources and organisational development concept regarding gender and diversity aspects.
Evaluation	Various
Sources/references	http://www.igad.rwth-aachen.de/engl/index.htm

BELGIUM

18. Belgian Women in Science (BeWiSe)	
Country/region	Belgium
Level of intervention	National – Policy
Who is driving it?	Government of Belgium: Federal Office for Scientific, Technical and Cultural Affairs Public
Sector focus	Science in general
Target group	BeWiSe is open to all women working or having worked at all levels in the sciences in the public and private sector (technology & industry and research & education) and those women and men who promote equal participation of women in science – in Belgium & the European Union.
Type of initiative	Government programme Support, participation, networking, reconciling professional and private life
Description of initiative	BeWiSe aims to provide support and facilitate participation and communication among women scientists in Belgium and the European Union. BeWiSe's main objectives are: <ul style="list-style-type: none"> • To support the position of women in science, both in public and private sectors • To make it more feasible for women and men to combine a scientific career with family life • To improve communication among women in the Belgian and European scientific community.
Activities	BeWiSe will work towards achieving these objectives by: <ul style="list-style-type: none"> • Creating a network for support and exchange of information, experience and knowledge • Providing an electronic meeting place with easy access for everybody • Organising meetings, seminars and workshops • Setting up contacts with similar European and international associations • Publication of a newsletter BeWiSe will take the following measures for fulfilling its three main objectives: <ul style="list-style-type: none"> • Support the position of women in science, both in public and private sectors • Increase the visibility of women working in various scientific fields in Belgium

	<ul style="list-style-type: none"> • Support actions aimed at increasing the number of women in science and technology • Promote sciences and women in science in the public • Provide role models and mentors of women in science • Encourage and motivate more young women to enter and stay in science • Support women with or desiring careers in science • Promote equal participation of women in councils and decision-making bodies • Make it more feasible for women and men to combine a scientific career with family life • Identify gender barriers in the career paths of women in science and by working towards removing such barriers • To improve communication among women in the Belgian and European, scientific community • Cooperate with groups and organisations with similar goals in Europe and elsewhere • Participate in a future European network of networks in concordance with the EC's policies for promoting women in science
Outputs	<ul style="list-style-type: none"> • An electronic meeting place • Meetings, seminars and workshops • Contacts with similar European and international associations • Newsletters • Role models and mentors of women in science • More young women to enter and stay in science
Intended outcomes, effect	<ul style="list-style-type: none"> • Increased visibility of women working in various scientific fields in Belgium • Increased number of women in science and technology • Role models and mentors of women in science • Support to women with or desiring careers in science • Increase in equal participation of women in councils and decision-making bodies • Increase in the feasibility for women and men to combine a scientific career with family life • Decrease in gender barriers in the career paths of women in science • Improve communication among women in the Belgian and European, scientific community
Evaluation	N/A
Sources/references	http://bewise.naturalsciences.be/

NETHERLANDS

19. Aspasia	
Country/region	Netherlands
Level of intervention	National and institutional
Who is driving it?	Aspasia is linked to the NWO's Innovational Research Incentives Scheme (Vernieuwingsimpuls) Dutch Ministry of Education, Culture and Science
Sector focus	Higher Education
Target group	Female academics to senior lecturer (or professorial) level, decision & policy makers
Type of initiative	Grant and award scheme
Description of initiative	Aspasia is designed to alleviate the under-representation of women in the upper echelons of academia. The aim is to encourage the promotion of female academics to senior lecturer (or professorial) level. Aspasia is linked to NOW's Vidi and Vici grant schemes. To qualify as an Aspasia candidate, a female applicant for Vidi or Vici grant must either have been awarded such a grant, or have had her application judged worthy of grant following the interview procedure but have been

	unsuccessful in obtaining one. The Aspasia premium may be used in a number of alternative ways. A condition of grant is that the board must use at least € 50 000 of the premium to fund more generic diversity policy measures by the university or faculty to increase the upward movement of female staff within the institution.
Activities	<p>Female participation in the mainstream competition for individual grants like the Vidi and Vici awards under the Innovational Research Incentives Scheme was relatively low and it was thought extremely important to encourage greater participation. As an incentive, it was decided in 2005 to award premiums to universities which promoted female recipients of Vidi and Vici grants to senior lecturer or professorial positions within one year of the award of the relevant grant.</p> <p>The programme has recently been evaluated and found to be successful. Even so, the rate of increase in female occupancy of senior lecturer and professorial posts is still too low. Starting in 2010, therefore, NWO intends to increase the impact of Aspasia by extending the programme to include female Vidi and Vici applicants who were selected for interview and whose applications the committee judged at that point to be worthy of grant, but who were not awarded grants by the NWO Governing Board because of resource constraints. In addition, NWO is introducing a separate scheme for Vici applicants attached to NWO or KNAW institutes.</p>
Outputs	Average of 40 grants per annum - € 100 000
Intended outcomes, effect	The aim of Aspasia is to encourage the promotion of female academics to senior lecturer (or professorial) level
Evaluation	The programme has recently been evaluated and found to be successful
Sources/references	http://www.nwo.nl/NWOHome.nsf/pages/NWOA_4YYAJV_Eng

AUSTRIA

20. Department of Gender Issues FWF (Austrian Science Fund)	
Country/region	Austria
Level of intervention	Institutional, National
Who is driving it?	Government, Academia
Sector focus	Science and technology
Target group	Scientists – male and female, funding applicants, retention of female researchers
Type of initiative	Funding and support
Description of initiative	<p>Austria still holds an unenviable position near the bottom of the European league table relating to the proportion of women in research, particularly in the natural and technical sciences. There is a great and continued need for action to remove or at least to lessen the disadvantages suffered by women in research careers. During its recent reorganisation, the FWF has taken the initiative to establish a "department" for gender issues. The short-term goal of this department is to bring about an improvement of the position of female scientists in FWF programmes anchored in the universities. In the long term, the FWF's measures should offer equal opportunities for men and women within FWF programmes. A working group made up of co-workers from all FWF departments' supports the department for</p>

	<p>gender issues.</p> <p>Goals:</p> <ul style="list-style-type: none"> • Guaranteeing the quality of recorded data and combination of available data: Data from the survey of those who have applied for FWF funding as well as project data (applications, final reports) should be statistically evaluated with regard to the equality of men and women • Raising the visibility of women in science: Careers of women in science should be made more visible by means of "female portraits" in the FWF Info magazine - FWF projects as a career model for women (START, applications by independent scientists, fellowship holders) • Improvement and enhancement of career opportunities for women in science: More intense networking should take place between female funding recipients, Measures to offer personnel development and training should be established in educational programs (graduate colleges) • Increase of the proportion of female project leaders and increased representation of women in the FWF organs: Clear indications in the guidelines for programs with age limits that exceptions to age limits will be made for women who have taken time to raise children • Programmes to promote female researchers: Hertha Firnberg and Elise Richter programmes
Activities	<p>The FWF is offering extremely well qualified female scientists who are working towards a career in universities the chance of a two-stage funding for a total of six years. The career development programme for female scientists is divided into the Hertha Firnberg Programme for post-docs, which aims to support women at the start of their scientific careers, and the Elise Richter Programme for senior post-docs, which aims at providing scientists with the necessary qualifications to apply for professorial positions within Austria or abroad.</p> <p>Hertha Firnberg:</p> <p>Target group: Highly qualified female scientists of any scientific discipline, who have completed their university studies</p> <p>Goals: Improvement of the career prospects for women in Austrian research facilities</p> <p>Requirements: completed doctoral studies, international scientific publications, aged 40 or under at the time of application, or at most 4 years of postdoc experience, allowance is made for time spent raising children, very generous support for women at the start of their scientific careers or on its resumption following maternity leave</p> <p>Elise Richter:</p> <p>Target group: Highly qualified female scientists and scholars of any discipline, who strive for a university career.</p> <p>Goals: to support the academic career of highly qualified female scientists and scholars and to enhance their university career, after completion of the programme a level of qualification should be accomplished which enables participants to apply for a local or abroad professorship. ("Habilitation" or equal qualification)</p>

	Requirements: appropriate postdoctoral experience, international scientific publications, preparatory work related to the proposed research project, no age limit
Outputs	Funding programmes, awareness raising, accurate sex-disaggregated data
Intended outcomes, effect	Quality of recorded data and combination of available data improved for FWF applicants, raised visibility of women in science, improvement and enhancement of career opportunities for women in science, increased proportion of female project leaders and increased representation of women in FWF.
Evaluation	N/A
Sources/references	http://www.fwf.ac.at/en/gender/index.html

21. Center for Gender Equality (University of Vienna)	
Country/region	Austria
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	HE
Target group	Female scientists in HE, students
Type of initiative	Mentoring
Description of initiative	The Center for Gender Equality is a service center at the University of Vienna. We coordinate and offer various measures aiming at gender equality and the promotion of women in academia. While offering measures for academic and administrative staff as well as students, we particularly focus on developing and implementing projects and initiatives which support and advance women's careers as academics and scientists and which enhance gender equality as a guiding principle of university culture.
Activities	<p>The mentoring programme of the University of Vienna (muv) is one out of several measures being implemented in order to accelerate the promotion of women and gender equality in the academic field. Women academics in distinct stages of their careers are provided access to mentoring relationships with professors of the University of Vienna as well as to career networks.</p> <p>muv is designed as cross-/interdisciplinary small group mentoring. The exchange of strategic as well as structural and content-related knowledge among the peer groups of mentees is as much important as is the one between mentees and mentors. Making the manifold forms of knowledge transfers transparent which are significant for careers and reflect on them critically is crucial in their approach to mentoring. As a consequence, their understanding of mentoring is informed by a critical approach to traditional mentoring relationships and to gendered hierarchies within university. muv builds on cross-disciplinary small-group mentoring based upon same- and cross-gender mentoring relationship: a male or female mentor promotes four mentees at a time. This organisational form focuses simultaneously on both vertical and horizontal promotional relationships. In doing so, it underscores the relevance of promotion and support not only by those with higher status, but also those of the same status (peers). Furthermore it significantly</p>

	<p>extends the potential for supportive networking and helps to reveal the hidden mechanisms for academic success.</p> <p>In addition, muv also provides accompanying measures for mentees and mentors. These include:</p> <ul style="list-style-type: none"> • Training courses for mentors and mentees before the start of the mentoring relationships • Seminar modules for mentees (on specific skills and topics of academic careers) • Gender training courses for mentors; Individual coaching for mentors • Supervision for the mentoring groups • Information seminars and events ;Informal get-togethers for all participants • Evaluation of the program • Institutional recognition system for the activities of mentors <p>Goals are defined by muv on three distinct but interlinked levels: mentee-oriented, mentor-oriented and institution-oriented goals. Among others the main goals are:</p> <ul style="list-style-type: none"> • Fast-tracking of career paths by providing access to informal and formal knowledge, strategies and new networks • Transfer of mentoring skills to teaching courses and lectures (especially diploma and doctoral/PhD candidate seminars) in order to establish a more effective promotion and support culture at the university • Establishing a model of gender-sensitive promotion of early career researchers <p>muv offers mentoring for the following target groups: Women PhD candidates, postdoctoral, and Habilitation (second theses) candidates. They may come from all faculties of the University of Vienna and have distinct degrees of institutional membership or work contracts. From 2010 on the programme focuses on postdoctoral and Habilitation candidates. The mentors are women and men professors of the University of Vienna.</p>
Outputs	Mentoring programmes, support and networking, training workshops
Intended outcomes, effect	Gender equality and the promotion of women in academia, and establishment of this in the university culture
Evaluation	N/A
Sources/references	http://personalwesen.univie.ac.at/en/gender-equality/

SWITZERLAND

22. Swiss federal programme for gender equality in universities	
Country/region	Switzerland
Level of intervention	National and institutional
Who is driving it?	Government, Swiss Universities Rectors Conference
Sector focus	Higher Education

Target group	Higher Education institutions, women working in HE
Type of initiative	Funding and award scheme
Description of initiative	<p>Higher education in Switzerland is shaped by the federal structure of Switzerland's political system, where the authority over educational matters lies with the cantons. Of the 12 Swiss Universities, only the two Federal Institutes of Technology, the ETHZ and the EPFL are under the direct authority of the Federal government (albeit as autonomous institutions), and directly funded by it. The ten "classical" universities are under the authority of cantonal governments, who also provide the major single part of their funding. Since the 1960, the federal government participates also directly to the university funding. But until now, the federal government can only shape the universities policies by incentives. In the late 1990s it was the conjunction of different elements that lead to the creation of the Swiss federal programme for gender equality at Swiss universities. On the one hand, the need for improvement in the realm of gender equality was blatant. Swiss universities were among the very first universities in Europe to accept female students in the 2nd half of the 19th century. However, in the late 1990s, while almost 50% of graduate students were women and about 1/3 among the doctoral students, they were only 7% among university professors. The 1990s represented also a period of major reforms in the Swiss Higher Education System. To steer these reforms, a new law was voted to regulate the financial support by the Federal government to the cantonal universities, which introduced some elements of competition. This new law provided the Swiss government with a new instrument, the "project related funds for innovation and cooperation", designed to help implement the government's policy of increased competition and cooperation among universities. The government decided to use this new financial instrument for the elaboration of the federal programme for gender equality at Swiss Universities. The programme was first introduced in the frame of the Swiss government's four-year implementation policy of the aforementioned law, for the years 2000-2003, and was then continued for a second and a third programme period (2004-2007 and 2008- 2011).</p> <p>The aim of the first programme period, as it was stated in the government's policy description, was to double the percentage of female full and associate professors at Swiss universities, from 7% in 1999 to 14% by 2006, and to increase the proportion of women at all stages of an academic career. Even though it seemed very ambitious in 1999, this aim has been met in 2006. Since, a new aim has been defined in connection with the current programme period, which is to reach 25% women professors by 2012.</p>
Activities	The implementation of the federal programme has been put under the responsibility of the Swiss Universities Rectors Conference. The Swiss federal government's programme is composed of three modules, each of which is dedicated to a different tool or measure to enhance women's careers in academia and research and access to professorship.

	<p>Module 1 - Incentives for the nomination of female professors: The aim of the module is to encourage, or rather, to reward universities who hire female professors on tenured positions. At the end of each academic year, universities are asked to provide the figures for newly appointed professors. Then, the yearly budget available for module 1 is distributed according to the number of newly-hired female professors with a permanent contract. Universities are free to use the funds received as needed. But it is recommended that the money is used for gender equality purposes, and there is no information that this is not the case.</p> <p>Module 2 - Mentoring programmes for the promotion of female junior researchers: For the implementation of the 2nd module, twice per programme period, that is once every two years since the programme started in 2000, universities are called to submit projects to the programme coordination, to set up mentoring programmes targeted to support women's careers in academia and research. Since 2000, this module has helped financing a wide range of mentoring initiatives at Swiss universities. In order to assure the universities commitment, and to foster the institutionalisation of the projects, universities need to contribute 50% of the total costs of the project (cooperation projects 30%). As universities can submit the same project at consecutive rounds for funding, it was further decided that, in order to foster the long-term institutionalisation of the projects, with each submission, the share of university funding has to be increased (with a maximum of 70% university funding for single-university projects and 50% own funding for cooperation projects).</p> <p>Module 3 - Support for Child Care, Work-Life Balance and Dual Career: During the first two programme periods (2000/03 and 2004/07), the third module has been dedicated to the establishment of childcare facilities. Part of the budget was distributed to universities as lump-sum contributions and as variable contributions (based on number of Master and doctoral degrees awarded to women). The rest of the money was allocated to projects for new child-care facilities or the creation of new places in existing structures, submitted by universities to the coordination of the programme. In the current programme round, module 3 specifically addresses the issue of Dual Career Couples (DCC). Part of the money available in this module has been distributed to universities if they signed a commitment and defined an implementation plan for Dual Career Support at their own institution. These structural measures to develop an employment policy favourable to DCC can comprise the implementation of an information and awareness campaign, the creation of Welcome-Service offices. The remaining amount of funding feeds into a "financial pool" for support of DCC couples. Universities who want to hire a woman professor or post-doctoral researcher who forms part of a DCC can apply for a one-time financial support of maximum 50 000 CHF (34 000 €) for expenses such as Bench fees and lab-costs, "seed money", relocation and child care support, coaching, starting salaries for the partner, etc., under the condition that the university provides a matching fund of at least CHF 55 000. Universities can</p>
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	also apply for this support if they hire a male professor and provide his female partner with an academic position. This newly shaped module is currently in a one-year trial phase, during which more detailed criteria for the allocation of funds are to be defined.
Outputs	Funding support, recognition and reward
Intended outcomes, effect	Enhanced women's careers in academia and research and access to professorship
Evaluation	<p>The federal programme for gender equality at Swiss universities has contributed to double the share of women professors from 7% at the end of the 1990s to 14% in 2006 and to generally improve the situation of gender equality at Swiss Universities. Among the effects of the federal programme for gender equality, one also has to mention the establishment of offices for gender equality at all universities in Switzerland. As mentioned above, before the start of the federal program, only about half of the universities in Switzerland did have professional structures for gender equality. In those universities where such structures already existed, the federal programme for gender equality strengthened them considerably. The establishment of professional structures for the promotion of gender equality at all universities had the additional effect to enhance the debate about gender equality on a regional and national level, to strengthen the position of the KOFRAH and to increase the exchange of experience and good practice. Notwithstanding this success, the academic career is still characterized by a process of horizontal and vertical segregation. After nine years of experience with measures supported by the federal programme for gender equality, it will be essential to consolidate these measures and enhance and complete them effectively, in order to be able to go one step further.</p> <p>From the outset, the steering committee of the federal programme was convinced of the importance of regular communication about the programme's aims and achievements. The steering committee therefore reserved some of its funds for external evaluation of the programme and the organisation of conferences. The first evaluation was conducted in 2002 and allowed to build up evidence in support of the continuation of the programme and its structure, based on the three modules. The evaluation mandated during the 2nd programme period thus could look back on a much longer period. This evaluation included a survey conducted among all university professors, and a series of case studies of mentees from the first mentoring programmes. Conferences that were organised approximately once every two years allowed to discuss themes and also controversial issues related with the federal program, such as the legality and effectiveness of financial incentives for the hiring of professors and the bias in the construction of excellence in the context of hiring procedures for professors.</p> <p>As mentioned above, the aim of <i>module 1</i> was to provide financial incentives for the hiring of women professors on tenured positions. According to several persons involved in drafting the first federal programme of gender equality, the authorities</p>

	<p>had expected that the financial incentives in module 1 would be the most important measure to achieve an increase in women professors. However, already the first evaluation showed that these incentives had only rarely been even mentioned in hiring procedures and an important majority considered that these incentives hadn't played a role in their decision. . The impact of module 1 is therefore less to seek in the direct impact of the money in the consideration of a hiring committee, but in the indirect effect of the stirrup created by it. As a matter of fact, from the start of the federal program, the module had animated heated debates, as some (men in particular) considered degrading that women should need a "dowry" to be appointed professors, while other pointed out that the money should be seen as a reward for the quality of non discriminatory appointment procedures.</p> <p>The effect of module 1 is therefore to find in an enhanced discussion on recruitment procedures for top level positions, more transparent – and therefore more gender adequate – recruitment procedures, and in the enhanced attention paid to the to the annual figures of recruited professors. As a matter of fact, never before had these figures been collected. In the survey that was conducted in the frame of the evaluation of the federal program, almost 50% of the responding professors estimated that equal treatment was not yet achieved in hiring procedures. The measures which receive the most support are: the representation of both sexes in appointment committees, job sharing and flexible work options, whereas quotas are the instrument which they favour the least.</p> <p>When the federal programme for gender equality started in 2000, formal <i>mentoring</i> was hardly known in Switzerland. Today, mentoring has got wide reconnaissance as effective measure to improve the support provided to early career researchers by academic institutions. The mentoring programs developed with support of the federal programme for gender equality thus have developed considerable experience and knowledge concerning this innovative tool for support of early career researchers and provided an important contribution to the national and international debate. Due to the relatively important number of mentoring programmes and due to the fact that they had been run in parallel, these programs provided an excellent opportunity to measure the impact of mentoring by comparing and evaluating different programs and kind of mentoring. The results from the case studies carried out in the frame of the evaluation of the federal programme show that mentoring is effective in improving the mentees' strategic career competences, enhancing the mentees' presence and integration in the scientific community, fostering their Networking competence and in providing a sustainable resource throughout whole career. While both one-to-one and group or peer-mentoring provide these benefits, they appear to do this in slightly different ways and degrees. Thus, the evaluation also indicates that mentoring is a flexible tool for the promotion of junior female researchers coping with various needs and at all stages of the career.</p> <p>Thanks to the support from the federal programme of gender equality in higher</p>
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	education, day care facilities exist now at each university in Switzerland, and with close to 300 new places created, the number of places available has been doubled. In addition, at several universities complementary offers have been established. For example child care services in case of sickness, or "temporary places" for women professors and post-docs from abroad. However, even though there is still a shortness of child care facilities, especially for babies, it has been observed that during the second programme period, the number of newly created places has heavily decreased, thus indicating that the universities (financial) capacities, was – temporarily – reached. After only one year, the effects of the measures in favour of DCC set up with the support of this module can not yet be assessed.
Sources/references	http://www.cdp.udl.cat/home/images/pdfs/presentacions_ji/pre_helene_fuger2.pdf

23. FemWiss (Association of Feminist Science Switzerland)	
Country/region	Switzerland
Level of intervention	National
Who is driving it?	Industry and academia
Sector focus	Science
Target group	Women in science, policy and decisionmakers
Type of initiative	Association, lobbying group
Description of initiative	<p>The Association of Feminist Science Switzerland is an independent national player in gender and science policy. The association is committed to the cause of women's and Gender Studies (Gender Studies) at Swiss universities. FemWiss switched to a policy of equal opportunities and the promotion of gender studies in science policy at the federal level.</p> <p>Goals:</p> <ul style="list-style-type: none"> - FemWiss aims to promote the feminist science - FemWiss advocates for women's and gender studies in research and teaching in tertiary education in Switzerland - FemWiss intervenes in the interest of equality and the promotion of gender studies in science policy at the federal level - FemWiss is generally understood as a network and forum for a critical feminist engagement with questions of gender and science research
Activities	<p>Achievement of objectives by: Representing the interests of women's and gender studies in science-related political discussions and decision-making processes; content distribution and discussion of gender studies and feminist science in the public; promotion of contacts and exchange of information between scientific working women; contacts with similar associations at home and abroad; regular organisation of conferences and courses, publication of conference proceedings; commitment to the promotion of female researchers and support women who are committed to the purposes of the association's purpose within and outside of academic life.</p> <ul style="list-style-type: none"> • Meetings: international conferences every two years to debate feminist issues. • FemPrix: Every two years, an outstanding work or a project that deals with scientific or journalistic Women's and Gender Studies/Gender

	<p>Studies and promotes the relationship of this research in Switzerland, was honored with CHF 3000</p> <ul style="list-style-type: none"> • FemInfo: Quarterly bilingual magazine serves as a platform for information in the field of gender studies, higher education and science policy in Switzerland and includes news on conferences, courses, publications and other information from these areas. • Lobbying: Targeted interventions and lobbying
Outputs	Publications, meetings and networking opportunities, lobbying activities, rewards
Intended outcomes, effect	Gender equality in science policies, education and research
Evaluation	N/A
Sources/references	http://www.femwiss.ch/de/

24. Swiss-German Mentoring Programme	
Country/region	Switzerland
Level of intervention	Institutional, national
Who is driving it?	Government, academia
Sector focus	HE
Target group	Early career women scientists
Type of initiative	Mentoring and support
Description of initiative	<p>The Swiss-German Mentoring Programme is a programme for the promotion of women in academic careers. It offers mentoring and accompanying measures (framework programme) for women scientists and researchers who are working towards habilitation or are engaged in post-doctoral and advanced doctoral studies at German speaking Swiss universities. The programme provides the advanced early career scientists (mentees) with an opportunity for a mentoring exchange involving a senior scientist (professor), and with networking facilities beyond the boundaries of their own universities. Mentoring and accompanying measures have been established to encourage mentees to plan their careers, to strengthen their self-esteem as scientists, and to integrate them more firmly in the science community through the establishment of adequate formal and informal networks. The Swiss-German Mentoring Programme is a personalised springboard for advanced early career women scientists. Its ultimate objective is to increase the number of female professors at Swiss universities.</p> <p>It has enjoyed the support of the Swiss Federal Programme of Equal Opportunities (Bundesprogramm Chancengleichheit, since 2001) and of the Swiss National Science Foundation (since 2006). This programme is being conducted jointly by gender equality departments at the universities of Berne, Basel, Fribourg, Lucerne, St. Gall, Zurich and the Swiss Federal Institute of Technology in Zurich (ETHZ). Project directorate and coordination are located at the University of Lucerne. In French-speaking Switzerland, a parallel programme has been established for the same target group - the Réseau romand de mentoring pour femmes. The Swiss-German Mentoring Programme is a founding member of eument-net, the European Network of Mentoring Programmes, which has been established within the 6th EU Framework Programme for Research and Technological Development.</p>

Activities	<p>The mentee can expect from the Swiss-German Mentoring Programme specific input on efficient networking; assisted search for a suitable mentor (male or female), in Switzerland or abroad; advice and assistance in how to conduct exchanges with her mentor; accompanying measures including an introductory event, a half-way evaluation and a final event; complementary courses in personal development training and career planning, to be held at various universities.</p> <p>The mentor can expect from the Swiss-German Mentoring Programme an opportunity to be involved in fostering early career scientists; an opportunity to share his or her experiences as well as systemic and organisational knowledge with highly qualified young women scientists; contact and exchange with an early career woman scientist; an opportunity to expand his or her leadership skills; an opportunity to review his or her own career and professional situation.</p>
Outputs	<p>The Swiss-German Mentoring Programme was launched in 2001 as Switzerland's first instrument for the promotion of female habilitation and doctoral students. So far, it has benefited a total of 186 women students, 77 of whom were doing a doctoral dissertation and 109 a habilitation. Its mentees complete their doctoral studies more quickly; embark on their habilitation work more effectively; expand their professional network; apply more actively for grants and research projects; and are more self-confident competitors for assistant professorships.</p>
Intended outcomes, effect	<p>The programme provides the advanced early career scientists (mentees) with an opportunity for a mentoring exchange involving a senior scientist (professor), and with networking facilities beyond the boundaries of their own universities. Mentoring and accompanying measures have been established to encourage mentees to plan their careers, to strengthen their self-esteem as scientists, and to integrate them more firmly in the science community through the establishment of adequate formal and informal networks. Its ultimate objective is to increase the number of female professors at Swiss universities.</p>
Evaluation	<p>Evaluation of the Swiss-German Mentoring Programme has shown that young women scientist have benefited from their mentoring relationships. Mentoring and accompanying measures have helped them improve their career-related knowledge and strategies, such as clearer career goals; enhanced knowledge of the science community; self-evaluation of their own qualifications; improved career strategies, etc. Moreover, their personal competences, such as self-confidence, objective-oriented working strategies, and their professional identity as a scientist have also improved as well.</p>
Sources/references	<p>http://www.academic-mentoring.ch/en/home/</p>

25. Bienvenue au Réseau romand de mentoring pour femmes

Country/region	Switzerland
Level of intervention	Regional, Institutional
Who is driving it?	Academia
Sector focus	Science, HE
Target group	Entry level female scientists and academics

Type of initiative	Mentoring and networking programme
Description of initiative	<p>Romand Network supports women who are beginning their scientific careers. Through mentoring, they are helping to solve the practical difficulties in the organisation of academic life and the realisation of their science project. Romand Network also aims to create a network of contacts across universities. Network romand mentoring for women is a regionally coordinated by the University of Fribourg in partnership with the Universities of Geneva, Lausanne, Neuchâtel, Switzerland and Italy with EPFL. Targeted at women working in science or HE, PhD candidates and PhD graduates.</p> <p>Offers the mentees:</p> <ul style="list-style-type: none"> • Contact with a mentor or mentor in Switzerland or abroad • Meetings with women sharing the same objectives • Of continuing education workshops • Supervision of a mentor-mentee relationship • A structure that fits the needs of participating • Financial support for participation in a conference and for their travel expenses. <p>Mentors in the <i>Réseau romand</i> are persons who share their experience, are aware of the support they received during their own careers; offer support through regular meetings with the mentee to achieve her goals ; wish to become involved with other mentors to promote the next generation of women academics; provide the opportunity to learn from the experience of a successful person and opportunity to discuss her professional projects and the fulfillment of concrete goals; better knowledge of formal and informal rules of academic career path; and support to network with new persons. In participating in a mentoring scheme, mentors have the opportunity to network with other mentors; network with researchers in their early career; be aware of research trends in the generation of the mentees; have stimulating discussion on their own work; and increase their social skills by mentoring.</p> <p>The federal “Equal Opportunities”, the Swiss National Fund for Scientific Research, the partner universities and the EPFL fund network romand mentoring. The number of mentees can benefit from the programme is limited to twenty-five women.</p>
Activities	<p>Contact with a mentor is established individually based on the application and preferences of the mentee. The focus of discussions and the frequency of meetings are specified in an agreement signed by both parties. The goals of the mentoring relationship are also fixed in the agreement. This document is the basis of the collaboration and, mentee and mentor commit themselves to respect it. Participants on the programme meet regularly to strengthen contacts and share experience. Through networking, the programme seeks to enhance the position of women researchers in academia.</p>
Outputs	Mentoring and support meetings and relationships, travel and conference stipends.

Intended outcomes, effect	Young scientists feeling supported and guided through entering their careers and have a network of contacts across universities.
Evaluation	N/A
Sources/references	http://www.unifr.ch/f-mentoring/fr/accueil

26. Le Mentorat (Geneva University)	
Country/region	Switzerland
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Higher Education
Target group	Young academics, PhD and Post-docs
Type of initiative	Mentoring, support, awareness-raising, information dissemination, professional development
Description of initiative	Goal is to promote women's careers within the University of Geneva. This is done through a series of programmes and activities, strengthening gender equality and gender sensitive policy and practices.
Activities	<p>Awareness-raising: Focused on changing attitudes and prejudices towards women's progress in academia through hosting conferences, meetings, exhibitions, discussions and review of HR and policy documentation.</p> <p>Getting started: A virtual platform has recently been opened to allow the dissemination of useful information for young academics and a discussion forum where any questions or concerns can be addressed.</p> <p>Doctoral programmes:</p> <p><i>LOOK</i>: for women doctoral students and /or engaged in an academic career, these workshops are designed especially to better understand the academic requirements and the functioning of the institution, to learn to write a CV; how to build a useful network.</p> <p>Changing academic mentoring: Personalised support for those who wish to pursue an academic career - Allowing women engaged in an academic career to receive an external perspective on their journey, to create or expand their scientific profile, build a network, to discuss how to balance the various activities of their lives and firm foothold in the academic community, so that eventually they are more likely to have access to faculty positions. The programme offers an individual relationship with a mentor for a year, a workshop and two group meetings in the presence of mentors, also allowing the formation of a network of women scientists. Mentors are female professors engaged and having an informed understanding of the academic background and the institution. The relationship with a mentor requires a certain commitment from the mentee, it is she who will seek the mentor and set targets in this exchange.</p> <p>Continuing Education: A one-day workshop provides key areas for reflection and</p>

	<p>to better communicate their research. Participants of their research or their thesis in progress devote one day to the presentation. Mentors and other participants provide constructive feedback. This is a unique opportunity to present research to a group of scientists from other disciplines and teachers who are not here to judge, but to offer advice and assistance. Presentation by a mentor of the different functions of researchers at the University of Geneva, and discussion of options and issues that arise for junior or advanced designed to fit into the academic sphere. Open to Doctoral and women of the intermediate and/or post doc at the University of Geneva. The doctoral thesis must have started their last two years at least.</p> <p>Post-doctoral support: Programmes aimed at assisting the post-doctoral candidate to choose a career within the university and that could potentially ease her into this challenging area.</p> <ul style="list-style-type: none"> • Stock of Excellence UNIGE - This subsidy takes the form of positions of lecturers for a period of three years. There are normally two to three Fellows of Excellence UNIGE year. Normally full-time, these mandates include up to 20% of teaching or clinical work. These posts are attached directly to the deaneries involved to ensure their independence. A good academic integration is also crucial. Monitor progress and support the commission is part of the program. • Springboard subsidy - Provides women at the University of Geneva, with the ambition and the scientific potential to pursue an academic career, an additional opportunity to expand their scientific dossier for the contract at the University of Geneva. The project beneficiaries are free of some of their charges such as their general teaching duties for six months. The funds are available to help finance the replacement. Participants are followed by university professors, who bring their support and advice so that they achieve the goals of the program. Workshops offer participants an opportunity to broaden their knowledge, skills and allow them to build a scientific network. Calendar of workshops and meetings. The project covers in principle six months. As it is set up individually, its implementation is not quite simultaneous for all participants. Available funds generally offer subsidies for eight years. • Balancing work and family? – Crèche, Arcade Midwives offer support to pregnant staff, brochures on work-life balance
Outputs	Interactive website, mentoring relationships, financial support, work-life balance supporting structures, professional development workshops
Intended outcomes, effect	Gender equality at the University of Geneva, more female academics choosing to stay in the institution and feeling supported and equipped
Evaluation	N/A
Sources/references	http://www.unige.ch/rectorat/egalite

27. Women in Industry (WIN)	
Country/region	Switzerland
Level of intervention	Institutional, grass-root
Who is driving it?	Industry, academia
Sector focus	Industry
Target group	Doctoral, post-doctoral students and young lecturers preparing for a career in industry
Type of initiative	Mentoring, skills development

Description of initiative	WIN is a mentoring programme for young scientists from the University of Basel, who want to learn about their job prospects and opportunities in the private sector. For a year she will be accompanied and advised by an experienced specialist or leader of Novartis.
Activities	Open to doctoral, postdoctoral students or university lecturers at the University of Basel in any discipline. Usually includes 25 mentees each linked with his/her unique mentor. On the basis of a common goal agreement, mentees and mentors / mentor meet approximately once per month and the programme runs for 18 months. Workshops are also run throughout the course of the programme.
Outputs	Mentoring, professional development workshops, evaluation reports
Intended outcomes, effect	Young scientists prepared for industry with realistic skill
Evaluation	Each round of WIN programmes is evaluated carefully roughly five months after the final workshop. Mentees, mentors and the project team provide information about the level of personal achievement, satisfaction with the programme and the impact of mentoring. In general the evaluations have indicated the long-term impact of the programme. Individual reports for each programme round available.
Sources/references	http://pages.unibas.ch/win/LINK_home_was_ist_WIN/home.html

28. netz+ - HSG Women (University of St Gallen)	
Country/region	Switzerland
Level of intervention	Grass-roots, institutional
Who is driving it?	Government, academia The services of "netz+ - HSG Women" are in major parts financed by Federal Equal Opportunity Programme. "netz+ -HSG Women" is also partnered with Syngenta Crop Protection AG and Accenture AG.
Sector focus	Science
Target group	Young students and scientists
Type of initiative	Networking, support, mentoring, professional development
Description of initiative	Through "netz+ - HSG Women", the HSG supports female students and young researchers in the development of their career and the expansion of their professional network. Our services include networking platforms for the exchange of ideas with colleagues and experienced female professionals, workshops to acquire key qualifications and peer group coaching for developing personal strengths and potential in a team setting with colleagues and a coach. With "Peer Mentoring netz+ - HSG Women" and "Mentoring Deutschschweiz" (for German-speaking universities in Switzerland), we carry out mentoring programmes with the aim of promoting young female academic talent.
Activities	Fireplace Evening Academia: To ask questions, receive information, exchange experiences, listen to each other ... High level women scientists welcome your questions and have to tell a lot as well. Alternating topics give impulses for a lively discussion in an easy-going lounge atmosphere. Dinner Hoch 4: Four top-class female guests – four round tables – four noble

	<p>courses: twelve female HSG students have the opportunity to converse on an individual basis with guest women from the fields of business, politics and science.</p> <p>HSG Women's Lunch: This lunch offers 12 female HSG-students the opportunity to have a conversation with a successful women professor. Issues for discussion include career paths, obstacles, the importance of networks and the support of mentors. The lunch takes place once per semester.</p> <p>Mentoring: Promotional project for young female researchers heading towards a career in academia. We support female researchers in concrete implementation steps with a view to a professorship. Young female researchers join a peer group for a period of one and a half years. With the funds of CHF 16 000 the group can organise activities in order to be better networked in the research community; extend their own disciplinary and interdisciplinary skills; acquire knowledge of gender-specific differences in a research career. Mentoring relationships are built up on the one hand between successful researchers and the peers, and on the other hand amongst the peers themselves.</p> <p>Qualification programme adjusted to needs in order to develop interdisciplinary qualifications: Communication and conflict resolution skills along with self-reflection and presentation skills are crucial for professional success at a high level. In our numerous workshops, female students and young women scientists acquire key skills for successful career development.</p> <p>Career planning for doctoral students: Looks at answering questions such as: Science or business? Finding my niche in the professional world. Where am I now? What are my core competencies? How do I want my future work life to look like?</p> <p>Coaching offers support to overcome individual challenges on the career path: Offering coaching for young female researchers who would like to eradicate a difficult or unclear situation - an initial discussion (30 min) free of charge. Further coaching sessions are then paid for at reasonable cost by the young researchers themselves.</p> <p>The Service Center Equal Opportunities has a sponsoring concept for companies who do show high interest in the career development of women.</p>
Outputs	Networking opportunities – lunches and lectures, mentoring programmes, professional development workshops, coaching, sponsorships, career guidance
Intended outcomes, effect	Young scientists feeling supported and well equipped for a career in science
Evaluation	N/A
Sources/references	www.netzplus.unisg.ch

SWEDEN

29. Swiss National Research Council (SNSF)	
Country/region	Sweden
Level of intervention	National
Who is driving it?	Government, academia
Sector focus	Science
Target group	Young and established female researchers
Type of initiative	Funding and support
Description of initiative	<p>The Swiss National Science Foundation (SNSF) is fully committed to gender equality. It aims to counter the under-representation of women scientists among the beneficiaries of the funding programmes through the use of specifically targeted measures. An important aspect of this commitment is the personal support of young women researchers (the facilitation of contacts and mentoring) as well as specific funding programmes and structural measures designed to promote the careers of women in research.</p>
Activities	<p>Adressliste Mentorinnen: Experienced researchers from all disciplines are available to advise young scientists specifically about their questions relating to career planning and funding by the Swiss National Science Foundation (SNSF). They do not offer mentoring as such, but are glad to share their personal experience.</p> <p>Mentoring programmes make an important contribution to promoting equal opportunities at universities by providing effective support for young scientists in establishing their careers. Under the equal opportunities programme of the Federal Government, federally funded mentoring programmes were introduced at Swiss universities in the year 2000.</p> <p>Marie Heim-Vögtlin Programme: Aimed at doctoral and postdoctoral students. They are designed to support well-qualified women scientists who are or have been forced to accept an interruption or reduction of their research activities due to family obligations or to a change in domicile due to the relocation of a partner for career reasons. The purpose of MHV-subsidies is to facilitate the professional integration of recipients at a Swiss university or technical university. According to an evaluation of MHV-subsidies conducted by the SNSF Equal Opportunities Commission for the period 1991 to 2002, the MHV programme is achieving its objectives. In order to achieve sustained re-integration, the host institution has to provide not only a written declaration of acceptance and job confirmation, but also a continuing financial commitment following the expiry of the MHV grant (cf. MHV Regulations, Article 4/2).</p> <p>MV network: Present and former recipients of MHV-subsidies can exchange news and views via a networking service to facilitate resumption of career, organisation of work and career planning in science. The MHV platform is based at the Gender Campus.</p>

	<p>Maternity leave: The SNSF is committed to operating a pro-active social policy for women. This is achieved for example via benefits offered during maternity leave in the context of SNSF-funded research projects. In practice, this means that the SNSF applies the regulations of the host institute for maternity leave. In certain circumstances, an application may be submitted for extension of the project term or for the appointment of a replacement. Relevant Divisions are glad to answer any questions relating to funding by designated applicants. SNSF fellows are entitled to a four-month period of paid maternity leave, if maternity occurs during the term of a research fellowship.</p> <p>Implementation of academic age limits: The abrogation of the age limits for women from 2002 to 2007 has augmented the proportion of female applicants and recipients of a fellowship keeping the quality criteria. In terms of equality between women and men the academic age limit has newly been implemented starting from 1 January 2008. Accordingly, prospective researchers can submit a proposal until three years after obtaining the doctorate and advanced researchers until five years after. Exceptions can be allowed under justified circumstances, for example due to family duties or by reasons of gender-based disadvantages, in particular for women.</p>
Outputs	Support, mentoring, funding, maternity leave
Intended outcomes, effect	Increased funding for female scientists and support during career advancement
Evaluation	Various
Sources/references	http://www.snf.ch/E/services-for-researchers/female-researchers/Pages/default.aspx

30. VINNMER Fellows	
Country/region	Sweden
Level of intervention	National level, Institutional level
Who is driving it?	Swedish Governmental Agency for Innovation Systems (Vinnova)
Sector focus	Various
Target group	Post Doc qualified female scientist aiming for leadership positions (especially professorships)
Type of initiative	Funding programme
Description of initiative	<p>The long-term objective of the VINNMER programme is to help to increase the number of postgraduates that can become the leaders of the future at universities/colleges, centres, research institutes and companies. The programme is directed towards the underrepresented gender in the scientific field of the application and towards researchers who have a PhD and who have completed their Post Doc qualification. The programme applies to qualification for people who conduct needs-driven research and in co-operation between a university/college and operations in the Private/public sector.</p> <p>VINNMER will run over the period 2007-2014 and the total budget, including co-</p>

	<p>funding, is just over SEK 600 million.</p> <p>VINNMER apply positive action to achieve equality effects for an underrepresented gender in fields where need for equalizing imbalances is great at the level of professor or similar position.</p>
Activities	<p>The programme consists of three parts:</p> <p>VINNMER Marie Curie international qualification: Relating to international collaboration between strong research and innovation environments and includes a combination of incoming and outgoing for the VINNMER Fellows. Option to apply for a planning grant.</p> <p>VINNMER – Marie Curie Chair: Relating to international collaboration between strong research and innovation environments with a focus of incoming international experienced researchers as VINNMER Fellows. Option to apply for a planning grant.</p> <p>VINNMER – national qualification: Relating to collaboration between universities/colleges/research institutes and the private/public sector.</p>
Outputs	Financial assistance – scholarships, chair positions, research funding
Intended outcomes, effect	The long-term objective of the VINNMER programme is to help to increase the number of postgraduates that can become the leaders of the future at universities/colleges, centres, research institutes and companies. The programme is directed towards the underrepresented gender in the scientific field of the application and towards researchers who have a PhD and who have completed their Post Doc qualification.
Evaluation	N/A
Sources/references	http://www.vinnova.se/vinnmer

UNITED KINGDOM

31. The Strategy for women in SET	
Country/region	UK
Level of intervention	National - Government policy
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS)
Sector focus	S&T general - Aimed at all public, academia & industry
Target group	Focused not so much on women, but on the present dominantly male scientists who are committed to building an equal future in the world of science. Current employers and employees in S&T, returners and those affected by mobility.
Type of initiative	Strategic document: Raising profile of women in SET, networking, good practice, recognition for good SET employers, information dissemination, monitoring progress of women in SET through stats, funding, advocacy, mentoring
Description of initiative	Promotion of women in S&T in the UK

	<p>The main initiatives from the strategy are:</p> <ul style="list-style-type: none"> • The establishment of a resource centre aimed at supporting, advising and working with SET employers and professional bodies in raising the profile of women in SET; running an expert women's database; producing good practice guides; and developing a means of recognizing good SET employers. • Recognition for good SET employers and sharing of good employment practice for women in SET. • Disseminating and sharing information • Expert women's database that houses the contacts for women that are experts in the field of SET. • Keeping up-to date statistics in order to accurately monitor and track the position of women's participation in SET. • Raising the profile of women in SET • Funding: innovative pilot projects, accommodation of returners, mobility • Advocacy • Mentoring and networking • Setting-up of an independent implementation group that is responsible for overseeing the implementation of the strategy.
Activities	<p>Resource Centre</p> <p>(now known as The National Resource Centre for Women in SET – the primary body and driver for all projects and activities)</p> <p>The establishment of a resource centre aimed at supporting, advising and working with SET employers and professional bodies in raising the profile of women in SET; running an expert women's database; producing good practice guides; and developing a means of recognizing good SET employers. The centre will draw on the experience of women and women in science organisations to do this' and coordinate their activity in an effort to achieve critical mass. Networking with professional scientists and organisations in the private, public and academic sectors will be essential to the success of the centre. Specific tasks that are set out for the centre are:</p> <ul style="list-style-type: none"> • Recognition for good SET employers and sharing of good employment practice for women in SET - Examples of schemes are: Investors in People, Opportunity Now, An Equal Opportunities Employer and the Sunday Times 100 Best Firms to Work For. • Disseminating and sharing information - The type of information sharing that is envisaged is face-to face as well as web based. The information would include a resource database of information about supportive mainstream policies, initiatives and budgets and well as examples of best practice; statistical and research information; overviews of women's organisations and their main activities and links to other relevant websites. • Expert women's database - The database will house the contacts for women that are experts in the field of SET. Requirements for the database is that it should cover a broad base of skills; be easily accessible; comply with data protection laws; regularly updated and use suitable screening mechanisms. The database will most likely be most useful to those seeking to employ highly skilled female scientists. • Keeping up-to date statistics - Data will be publically hosted by the centre and will be collected from a university that has been contracted to collect statistics on women in SET. Data will also be sourced from professional SET organisations. In the long term, it is planned that the data will also be disaggregated by gender. Such statistics will enable the accurate monitoring and tracking of the position of women's participation in SET. • Raising the profile of women in SET - The centre will explore ways in which the profile of women in SET can be lifted, possibly through the involvement of media and marketing campaigns and award schemes. Some of the existing award schemes that can be expanded on are the Athena's Project inaugural Athena Awards and the Royal Society's

	<p>annual Rosalind Franklin Award.</p> <p>Funding - The centre will also support innovative pilot projects by raising awareness and funds from the private sector. The centre will also manage and make funds available to female returners in the field of SET.</p> <ul style="list-style-type: none"> • Returners - The challenge is to find ways of accommodating women in SET who have left the field for a period of time (mostly because of family responsibilities) and then wish to rejoin their professions. The strategy encourages employers to sustain pro-active contact with female employees during the career break in an effort to minimise the impact of the break and/or to promote their employability and skills to other parties that could make use of their particular skills on their return. Such employers are to be identified by the centre and financial assistance is to be provided for further pilot projects and duplication. An example of such an initiative is a DTI funded scheme, known as TCS, soon to be re-launched as Knowledge Transfer Partnerships. • A related problem is the issue of mobility of SET professionals. Funding is being provided through a scheme of the Royal Society and of the Dorothy Hodgkin Fellowship Scheme that enables scientists who need to relocate due to e.g. family responsibilities, to continue their research with the minimum of disruptions. • Advocacy - Using 'cross-Government machinery' to ensure that government departments are good SET employers. • Mentoring and networking - Networks could embody anything from a professional body, a web based network to more hands-on groups that arrange talks/events and face-to face meetings. For example, the Athena Project has worked to establish regionally based networks of women working in SET in higher education, research establishments or in related industry and the professions, These Local Academic Women's Networks work to raise the profile of women within these institutions and to improve women's career development. Each network has its own agenda – some are based around speaker programmes, others focus on mentoring and networking. The strengthening of these networks, and an increase in women's participation in professional bodies, is something that might be addressed with innovative grants. In terms of mentoring, the government is funding a national pilot mentoring project. The project is a joint collaboration with WES and AWISE (Women's Engineering Society and Association of Women in Science and Engineering) that aims to match potential mentors and mentees. • Implementation group - An independent implementation group is to be set –up that will be responsible for overseeing the implementation and impact of the strategy over a two year-period.
Outputs	<ul style="list-style-type: none"> • A resource centre providing examples of good practice, dissemination and information sharing, expert women's database and coordinating the work of women in science organisations • A resource database of information about supportive mainstream policies, initiatives and budgets and well as examples of best practice; statistical and research information; overviews of women's organisations and their main activities and links to other relevant websites. • Up-to date statistics • Award schemes to promote the profile of women in SET • Funds for female returners
Intended outcomes, effect	<ul style="list-style-type: none"> • The establishment of a resource centre aimed at supporting, advising and working with SET employers and professional bodies in raising the profile of women in SET • Running an expert women's database; producing good practice guides; and developing a means of recognizing good SET employers • Recognition for good SET employers and sharing of good employment practice for women in SET • Disseminating and sharing information • Expert women's database that houses the contacts for women that are experts in the field of SET • Keeping up-to date statistics in order to accurately monitor and track the position of women's participation in SET • Raising the profile of women in SET
Evaluation	N/A

Sources/references	http://www.ec.europa.eu/research/science-society/...06/web2-williams_en.pdf
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31a. UK Resource Centre for women in Science, Engineering and Technology (UKRC)	
Country/region	UK
Level of intervention	National: Policy influencing, implementation
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills
Sector focus	SET general - Aimed at all public, academia & industry
Target group	Women in SET in the UK, current employers and employees in S&T, returners and those affected by mobility
Type of initiative	Resource centre for support, advice and work with SET role-players to raise the profile of women in SET, reward for good practice, guidance for guide practices, networking opportunities.
Description of initiative	<p>Launched in September 2004, the UKRC is funded by the Department for Innovation, Universities and Skills (DIUS) and is the Government's lead organisation for the provision of advice, services and policy consultation regarding the under-representation of women in science, engineering and technology (SET). It was set up as one of the key recommendations of the Government's 2003 Strategy for Women in SET, which followed the SET Fair Report in 2002. The UKRC is led by a partnership including the University of Cambridge, the University of Oxford, the Open University, Sheffield Hallam University, Queen Mary University of London, with Bradford College as the lead partner.</p> <p>The UKRC provides a central point of information and advice for industry, academia, professional institutes, education and research councils and for women entering, returning and progressing in SET careers. Services are provided from a central base in Bradford, West Yorkshire, from national centres in Scotland and Wales and from a local centre in the South East of England, where the concentration of scientists, engineers and relevant employers is particularly high.</p> <p>Vision: to create an environment in UK science, engineering and technology education, employment, research and policy-making in which women contribute to, participate in and share the benefit equally to their male counterparts. To ensure that the UK knowledge driven economy benefits from the inclusion of the talents of the whole population and that women benefit from the opportunities afforded by it.</p> <p>Mission: to improve the participation and position of women in science, engineering and technology in industry, research, academia and the public service, to benefit the future productivity of the UK and the lifetime earnings and career aspirations of women. To deliver on this, we aim to:</p> <ul style="list-style-type: none"> - provide a centre of excellence, accessible to the whole of the UK, for government, employers, research councils, educators, careers professionals, the media and women seeking information, data, advice

	<p>and best practice solutions regarding entry, retention and advancement practices for women in science, engineering and technology</p> <ul style="list-style-type: none"> - promote science, engineering and technology as viable and attractive career options for women - influence, advise and embed equality practices into organisations to enhance the career opportunities for women in the science, engineering and technology professions and routes into these careers - deliver and promote services to support women's entry, return and progression in SET learning and employment and foster women's engagement and participation – focussing on key life and career transition stages. - reduce fragmentation and reinvention of UK gender and SET activities and support women in SET organisations and networks
Activities	<p>The UKRC provides advice on gender equality policy and practice for employers in industry and academia and has a range of products and services to help employers implement change. We run accreditation and award schemes to recognise and share best practice. The UKRC works directly with employers in industry to promote better employment practice and workplace culture, to embed equality and diversity. Our aim is to help employers attract more women into science, engineering and technology, to retain women by improving their workplace experience and to fix the 'leaky pipeline' at critical points when women often fail to progress or leave, never to return. We want to persuade employers not only that it is good practice to promote diversity and inclusion and should form part of their corporate social responsibility, but also that it makes sound business sense. The UKRC can help employers establish schemes and projects to support and advance their women employees including: mentoring schemes and training for mentoring co-ordinators, mentors and mentees; leadership development; work experience placements; career break management; and implementing flexible, part-time and job share working. Our experienced consultants will help companies assess the issues they may need to address and offer practical solutions, through tools and guides developed specifically for the science, engineering and technology sectors. Through our accreditation and award schemes we are able to reward and acknowledge those employers who are working hard to improve their diversity and inclusion and we can then share this best practice through our case studies.</p> <p>The UKRC provides practical advice, training, grants, bursaries, mentoring and networking for women looking to enter into SET employment or education, to return after a career break or for those already in the sector to progress their careers. A key part of the work of the UKRC is to encourage and empower women to take up, return to and progress in careers within science, engineering and technology. Central to this is our RETURN campaign, which supports qualified women scientists, engineers and technology professionals who have taken a career break to return to work in their sector. The services we provide include a 10 week online course for returners through the Open University. The next course, known as the T161, starts in May this year, and you may be eligible for a bursary from the UKRC if you apply before 28th March. In addition, The RETURN campaign can offer mentoring, advice and guidance on getting ready for the workplace, work placements and help in finding permanent jobs. We have worked with over 1000 women since our launch in 2004 and helped over a third of those to return to work</p>

	<p>or study in science, engineering and technology.</p> <p>We also work to raise the profile of women in science, engineering and technology and specifically to increase the number of women members on public bodies within these sectors. The UKRC is working to raise the profile of women in SET through a broad range of exciting and innovative interventions:</p> <ul style="list-style-type: none"> - Promoting the GetSET Women online database to provide access for media, government public bodies and many organisations to women at all stages of their careers in SET - Hosting events where women in SET are the main speakers and where they can meet the media to raise their profile - Running a focused mentoring scheme for women in SET who are interested in public body participation - Arranging media training for women as well as seminars and workshops to find out how to get involved in media and public body work - Promoting opportunities for women in SET to become involved in SET decision making at all levels via the GetSET website and newsletter - Working with SET media bodies including the Science Media Centre to build the strategy - Providing CPD for women to develop their skills for public life - Supporting PAWS speaker events to bring women in SET together with writers and media - Providing and disseminating resources, training and advice for schools and careers professionals to promote STEM and built environment careers to girls - Funding PAWS scriptwriting grant scheme for ideas featuring women scientists and engineers in leading roles - Providing assistance to those seeking SET women role models, speakers and media contacts - Encouraging women in SET at all levels to become role models and mentors and building case studies and blogs on the UKRC website - Promoting activities that celebrate the excellence of women in SET - Commissioning research that can inform future action and help understanding of the issues <p>We collate and compile statistics on women's participation in SET education and employment and these can be freely accessed online. We also fund research projects in this field. We also fund individual projects and initiatives that aim to improve women's participation, progression or profile within science, engineering and technology. The Resources section provides access to a range of information that covers all areas of research, organisations and initiatives on the issues relating to girls and women in science, engineering and technology. Our SET Directory includes links to a plethora of groups, organisations and websites engaged at all levels with supporting women in SET and tackling the many issues that contribute to their under-representation in the sector. The Publications Catalogue hosts over 4,000 items. Completely searchable, it includes links to downloadable resources as well as listing conference proceedings, journal articles, promotional material and a variety of reports and web-based articles. You will also find here a list of the UKRC's publications and products: these include ten Good Practice Guides, promotional literature to encourage girls into and women back into SET careers, research papers and UKRC-commissioned survey results. Most of these are available free of charge through the online order form. Case studies and role models have been shown to be some of the most effective means of engaging girls and the public with the variety and scope of the careers in SET at all levels. Over</p>
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	100 women have listed their personal stories on our site. This fully searchable listing shows women at all stages of their careers across all the sectors and many of them are downloadable in a ready to use format.
Outputs	Various – publications, databases, project reports, links etc
Intended outcomes, effect	<ul style="list-style-type: none"> - Equal opportunities for women in SET to contribute, participate and share in benefits of UK science - Improved position of women in SET in industry, research, academia and public service - A centre of excellence providing information, data, advice and best practice solutions regarding entry, retention and advancement for women in SET to accessible to all role-players - Increased participation of women in SET – entry, returners and progression
Evaluation	N/A
Sources/references	http://www.theukrc.org/

31b. Website of statistics on women in SET	
Country/region	UK
Level of intervention	National
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET in general - Aimed at all public, academia & industry
Target group	Researchers, government, higher education institutions
Type of initiative	Website Profiling, monitoring women in SET over time
Description of initiative	Web site of statistics on women in SET in the UK. The aim of the web site is to provide information on the current situation, and to build up an archive showing changes in the pool of SET skilled and experienced women over time.
Activities	<p>The statistics available on the web site include:</p> <ul style="list-style-type: none"> - A commentary on the trends of women in scientific education and employment based on data from a number of sources, including the Department for Education and Employment and the Office for National Statistics - Summary plots and tables with key data - Data tables in Microsoft Excel format to access and download - Links to other sources of information and statistics on women in science <p>The main areas covered are: Compulsory school education; Post-compulsory education; Skill-based qualifications; Higher education; Employment; Research Councils; Public appointments; Glossary of terms. The commentary looks at trends from girls' compulsory school education up to women's representation on SET-related public bodies, where possible commenting on change over several years. Icons beneath can be highlighted to access the data in spreadsheet format. These tables may be printed out or saved electronically as Excel files for further analysis.</p>
Outputs	Various datasets
Intended outcomes, effect	Information on the current situation, an archive showing changes in the pool of SET skilled and experienced women over time.
Evaluation	N/A

Sources/references	http://www.ost.gov.uk/research/funding/promoting.htm
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31c. Expert women's database	
Country/region	UK
Level of intervention	National
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET general - Aimed at all public, academia & industry
Target group	Highly skilled female scientists, media, governmental bodies and those working to promote the position of women in SET
Type of initiative	Internet based resource for increased profiling and participation
Description of initiative	This database was originally developed by WiTEC (European Association for Women in Science, Engineering and Technology), in 1997 as the first initiative of its kind in Europe to be used as a tool to raise awareness of the skills and knowledge of women in science, engineering and technology. Containing information on key women who are considered experts within their field of SET occupations and are respected figures for their views, experience, expertise and as role models for society, it has become an important tool for the media, governmental bodies and those working to promote the position of women in SET.
Activities	Search functions for: positive role models, mentors, speakers, media contacts, partners for projects or experts interested in taking up public appointments.
Outputs	Search functions for: positive role models, mentors, speakers, media contacts, partners for projects or experts interested in taking up public appointments.
Intended outcomes, effect	Increased awareness of the skills and knowledge of women in SET
Evaluation	N/A
Sources/references	http://www.equalitec.org.uk/other/Related/expert_women_database.html

31d. Athena Project	
Country/region	UK
Level of intervention	National, policy level
Who is driving it?	In achieving its aims, Athena has worked in partnership with universities, research councils and SET professional and learned societies. Athena is housed and supported by The Royal Society. Its other supporters include BP, Equality Challenge Unit, Department of Innovation, Universities and Skills, Institute of Physics, Pfizer, Royal Academy of Engineering, Royal Society of Chemistry, UKRC, and The Wellcome Trust.
Sector focus	SET general
Target group	Women in SET in HE
Type of initiative	Advancement of women in SET in HE, access to senior positions
Description of initiative	The Athena Project was established in 1999 by the UK higher education funding

	<p>councils, UniversitiesUK and Office of Science and Technology, Department of Trade and Industry. Its aims are the advancement and promotion of the careers of women in science, engineering and technology (SET) in higher education and research to achieve a significant increase in the number of women recruited to top posts. Athena works with partner HEIs to:</p> <ul style="list-style-type: none"> - Develop, share, encourage and disseminate good practice - Increase the number of women working in SET at all levels - Improve the career development, recruitment, participation, progression and promotion of women in SET. <p>The Project works in partnership with UK universities, research organisations and SET professional and learned societies. Athena asks for a commitment from senior management to any Athena initiative in which they participate. Their commitment raises awareness of the issue of women's career progression and ensures a high profile for Athena's activities. Athena works with its partners to develop and disseminate good practice in SET employment.</p>
Activities	<p><i>Athena Survey of Science, Engineering & Technology in Higher Education (ASSET)</i>: Athena's purpose in running the survey is to provide a firm basis from which to understand and address the barriers to women's progression in scientific careers. The survey questions, (2003, 2004, 2006surveys), address the areas identified by Athena as key to the differences between men's and women's progression through and enjoyment of a career in science and engineering. The survey is open to all male and female UK based scientists, engineers and medics, whether in industry, public or private sector research, or research and development organisations, in education including higher and further education, the NHS and other public sector employment. The survey is open to those in corporate policy and management functions, and in operational, manufacturing, field and service posts, as well as in teaching and research. Understanding the career experiences, perceptions and ambitions of all these groups is important. A report on the headline findings from the survey will be published in spring 2007. Comparisons will be made across the main SET employment sectors, and the main SET disciplines. These will focus on the areas which the survey's sponsors and supporters can influence, which employers can control, and where change can make a difference.</p> <p><i>Athena Development Programmes (1999 and 2000)</i>: The focus for the 1999 programme was mentoring, networking and staff development, and for 2000 was changing organisational culture, practices and processes. For example, the Athena Project has worked to establish regionally based networks of women working in SET in higher education, research establishments or in related industry and the professions. These Local Academic Women's Networks work to raise the profile of women within these institutions and to improve women's career development. Each network has its own agenda – some are based around speaker programmes, others focus on mentoring and networking. The strengthening of these networks, and an increase in women's participation in professional bodies, is something that might be addressed with innovative grants.</p> <p><i>The Athena Awards</i>: The Awards build on the success of Athena's two development programmes and recognise and publicise the good practice that is developing in HEIs, by SET departments and groups of women working in support of Athena's aims.</p> <p><i>Athena SWAN Charter</i>: The SWAN Charter, originally developed by London Metropolitan University's Scientific Academic Women's Network won a prize from</p>

	<p>the Institute of Physics in the 2003 Royal Society Athena Awards. The Athena SWAN charter is being developed with support from the UKRC as a recognition scheme for HE employers. The Athena SWAN Charter scheme, which will be launched in summer 2005, will be open to all UK universities who are committed to working towards the achievement of Athena's aims, objectives and targets. . Membership of the Charter scheme, with its bronze, silver and gold SWAN awards, will enable universities to identify themselves as employers of choice, not only to their staff but to their students, their funders, the research councils and industry. There will be no charge for membership. However, to remain in membership, universities and their SET departments and faculties will be expected to produce action plans, and to measure and report their progress. The scheme draws together and builds on the successes and outputs of work by Athena and its partner universities, their evidence-based good practice, the recently piloted good practice checklists and the key performance indicators proposed for chemistry departments, and Athena's ASSET surveys of over 7,000 male and female scientists working in higher education and research.</p> <p>Athena's comprehensive Guide to Good Practice (1999 to 2002) with a CD rom containing previously published reports on work by Athena's partner HEIs, was launched at the Athena Advancing Conference at the Royal Society on 18 March 2003.</p>
Outputs	Has played a significant role in women in S&T at universities such as report and good practice guides that have been compiled using the direct experience of university projects and awards.
Intended outcomes, effect	Increase in the number of women recruited to the top SET posts in HE. Improved career development, recruitment, participation, progression and promotion of women in SET.
Evaluation	Various
Sources/references	http://www.sebiology.org/publications/Bulletin/March08/Athena.html

31e. Local Academic Women's Networks	
Country/region	UK
Level of intervention	Regional
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET in HE - Aimed at all public, academia & industry
Target group	Women working in SET in HE, research establishments of related industry and professions
Type of initiative	Network to raise profile of women in SET in HE and improvement of career development
Description of initiative	Regionally based networks of women working in SET in higher education, research establishments or in related industry and the professions. These Local Academic Women's Networks work to raise the profile of women within these institutions and to improve women's career development.
Activities	Each network has its own agenda – some are based around speaker programmes, others focus on mentoring and networking. The strengthening of

	<p>these networks, and an increase in women's participation in professional bodies, is something that might be addressed with innovative grants.</p> <p>Northern LAWN (Leeds and Bradford): Since 2002, Northern LAWN has continued to host a series of research seminars to showcase individual women academics' work. Northern LAWN's committee has made a conscious decision to focus in particular on seminars from highly regarded and successful female academics who offer an insight into the more personal side of their careers to date. These inspiring seminars have given more junior members a valuable insight into the idiosyncratic career paths of successful female academics. Other recent Northern LAWN events have included practical workshops sessions on topics such as developing successful grant applications. Others have centered on issues relevant to particular institutions. For example, Bradford LAWN hosted seminars by Janet Jones, Careers Service Bradford University, on 'Worklife balance for women at Bradford' and Professor Grace Alderson spoke at Bradford about 'Developing a teaching and learning plan'. The network has been very useful in bringing people together and providing the opportunity to meet and learn from others' experiences. At least one substantial piece of research has arisen as a result of Northern LAWN. However, the management of the activities has become increasingly difficult as the distribution list has grown. A key reflection is that Northern LAWN was at its most successful before it 'grew too much'. Perhaps this reflects the nature of most networks. To counter this, Northern LAWN will focus not on recruiting members, but on consolidating links. Active members in the network value the activities, and although not always in a position to fully contribute, they report that they benefit from the meetings organised thus far. Other avenues for development include some specialist seminars on areas of studies, and continuous discussion on issues related to curriculum and career development.</p> <p>North East Local Academic Women's Network (NELAWN): In 2003 North East Local Academic Women's Network (NELAWN), a regional networking group, based in the School of Informatics at Northumbria, was launched. It now has members from all the Northeast universities – Northumbria, Newcastle, Durham, Sunderland and Teesside Lunchtime seminars are held once a month. The aims of the LAWN are to:</p> <ul style="list-style-type: none"> - develop a network of support and collaboration for female academics and researchers in SET and associated disciplines, within and between participating HEIs and industry, commerce and the professions in the Northeast - disseminate institutional good practice relating to gender issues at operational and strategic level within participating HEIs - address the gender imbalance at all levels in SET, focusing on female recruitment, retention, participation, progression and promotion promote the work of female researchers of all levels of experience and improve institutional practice relating to research support <p>Following the launch a survey established what women wanted from the network . The programme that was developed reflected their views. An admin staff appointment was made and email is used to inform/respond to members. The website launched October 2003 has improved communications and publicity for all events. The website registers and provides a platform for new members, supports networking/ informal mentoring and provides information on research, vacancies, special events, articles and issues on SET. The NELAWN committee includes delegates from each of the NE Universities and regular contacts are maintained with all the relevant HR staff. Members attend conferences etc related to Athena on a regular basis. Each University will continue their own meetings and encourage women to become NELAWN members and involved in its activities. The working committee is firmly established and is working to make further contacts in NE HEIs, industry, and the professions and to develop the NELAWN programme of activities and events. At present they have enough funding to</p>
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	<p>support their programme through to the end of the 2003/04 academic year but need to raise funds to continue their work.</p> <p>LAWN in Northern Ireland: The LAWN in Northern Ireland was launched in November 2002. It operates mostly as collaboration between Queen's University Belfast (QUB) and the University of Ulster (UU). A conference on 'Work-life Balance' took place at the Odyssey Centre and another major event of 2003 was the symposium 'Career paths and role models' held at UU. Its success was highlighted by comments such as 'inspiring to see different routes to successful careers' and 'useful to see the importance of making opportunities, knowing what you want and doing what you want'.</p> <p>The programme committee, has been working hard recently and decided on the topic 'Research and teaching: developing parity of esteem' as a focus for the next main meeting which will be held at QUB in September. Invited experts in the RAE and L&T domains will take the keynote positions with a view to exploring the challenges particularly for recently-recruited academics in the approach to RAE 2008 combined with the stringent requirements to demonstrate high quality teaching performance, all this at a time when young women may be dealing with changes in family circumstances. LAWN meetings are widely advertised, in all university locations in Northern Ireland, and there has been recent recruitment from St Mary's University College in Belfast. It is intended to make links also with female academic groupings in the South of Ireland. The year 2004 marks the centenary of the admission of women to Trinity College Dublin. There are number of events planned to celebrate the occasion, and the Trinity Week Symposium on 'Reshaping the Intellectual Landscape: Women in Academe' in May presented an excellent opportunity for us to get acquainted. Significant outcomes were the connections made with the Office of Science and Technology, and the Gender Equality Unit at the Department of Education and Science in Dublin.</p> <p>There is a lot more to be done in developing the sphere of activity of the LAWN in NI. One idea on file is to provide a forum to discuss the importance of collaborative working. It was interesting to note, therefore, that the results of a survey presented at the recent American Association for the Advancement of Science meeting highlighted the fact that when it came to academics speaking with colleagues about their research on a regular basis, men were more than twice as likely to do so as women. Perhaps there are issues about self-confidence here, which is what the LAWN is about.</p>
Outputs	Various – workshops, meetings, conferences, publications, networking opportunities
Intended outcomes, effect	Raises profile of women within HE institutions and improved women's career development.
Evaluation	N/A
Sources/references	http://www.athenaforum.org.uk/CaseStudy3.htm

31f. Royal Society's annual Rosalind Franklin Award	
Country/region	UK
Level of intervention	National - intervention
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Run by the Royal Society
Sector focus	Natural science, technology and engineering - Aimed at all public, academia & industry
Target group	The Award goes to an individual, most likely in mid-career, who has made an outstanding contribution to any area of natural science, technology or engineering. If the winner is a woman, she will be seen as a role model for young girls and women scientists and the winner is a man, he will enable the key messages of gender mainstreaming to be communicated widely in SET.
Type of initiative	Award scheme for the promotion of women in SET
Description of initiative	This competition, which is run by the Royal Society, is devoted to promoting women in SET. The Award goes to an individual, most likely in mid-career, who has made an outstanding contribution to any area of natural science, technology or engineering. The Award consists of a medal and a cash award of £30,000 to be spent by the recipient on equipment, study tours or other research related activities. One of the criteria for nomination to the Award is that nominees must indicate what they would do, if they won the Award, to promote women in SET. This might include, for example, establishing a women's mentoring scheme, writing a book to inspire women in SET, or organising a lecture tour to promote themselves as a role model. The winner will be invited to give a lecture at the Royal Society at a high profile event to celebrate women in SET after which the medal will be presented. The annual competition is open to both men and women and there is no age limit. If the winner is a woman, she will be seen as a role model for young girls and women scientists and the winner is a man, he will enable the key messages of gender mainstreaming to be communicated widely in SET.
Activities	Award
Outputs	Financial reward and acknowledgement
Intended outcomes, effect	Increased profiling and promotion of women in SET.
Evaluation	N/A
Sources/references	http://royalsociety.org

31g. The women returners study	
Country/region	UK
Level of intervention	National, policy influencing
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for

	Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET - Aimed at all public, academia & industry
Target group	Returners (SET qualification but working in other fields), potential employers
Type of initiative	Research study on Participation, retention– especially returners
Description of initiative	The research aimed to investigate the ways in which the UK can maximise the return on investment made in training graduates in SET and address projected skills shortages. The research project was designed: <ul style="list-style-type: none"> - To quantify the number of people with degree level qualifications in SET - To identify how many are not currently working in SET occupations and the activities they are employed in - To investigate how, if at all, they could be attracted back into SET occupations - To identify how employers could support those returning to the sector and how more might be encouraged to utilise returners - To identify existing schemes and whether these meet the needs of employers and returners
Activities	Research activities
Outputs	Research report, recommendations and data
Intended outcomes, effect	<ul style="list-style-type: none"> - Accurate number of people with degree level qualifications in SET - Indication of how many SET degree level graduates are not currently working in SET occupations and the activities they are employed in - Indication of how they could be attracted back into SET occupations - Ideas of how employers could support those returning to the sector and how more might be encouraged to utilise returners - Information on existing schemes and whether these meet the needs of employers and returners
Evaluation	N/A
Sources/references	No active link since completion of study

31h. Association for Women in Science and Engineering (AWiSE)	
Country/region	UK
Level of intervention	National – implementation level
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	Science and Engineering - Aimed at all public, academia & industry
Target group	Women and girls in SET in the United Kingdom
Type of initiative	National organisation/Association A forum and a network, which aims to promote girls and women in SET via support and the provision of information and resources.
Description of initiative	AWiSE, the UK association for women in SET, is a national organisation with a central office in London and branches in the regions. The impetus for the founding of AWiSE was 'The Rising Tide' published by the UK Government (HMSO) in 1994. Its remit was to advise the Government on ways in which the potential, skills

	<p>and expertise of women could best be secured. AWISE represents all the sciences and technologies, at all levels, from mathematics and engineering to biomedicine, anthropology, environmental and social science, including education, research, industry, administration, and the media.</p> <p>The objectives of AWISE include to:</p> <ul style="list-style-type: none"> - Promote SET for girls and women - Act as a forum - Provide a network for mutual support - Form a collective voice, and - Act as a centre of information and resource.
Activities	<p>Networking, information-sharing, journal, career advice, mentoring, science promotion</p> <p>National AWiSE is working with a range of women's organisations, and increasingly with government, politicians, and the media. In the regions, we are developing networks of women at all levels and in all career paths, in education, in industry, in research institutes, on career breaks, or looking for a job. Branch programmes of scientific and social activities are advertised locally and described in our national journal "Forum". "Forum" contains a variety of materials to inform women and girls on the world of SET and on women's issues. Activities include:</p> <ul style="list-style-type: none"> - meetings, workshops, Open Forums, visits, newsletter - encouraging girls into SET programmes - activities to promote the understanding of science among girls and women - education/industry/women's group liaisons, at all levels - career advice, mentoring, support for women embarking on or returning to science and engineering - collecting and providing information on women in science and engineering - networking with sister organisations at home and abroad.
Outputs	<ul style="list-style-type: none"> - Resources for returners: literature, links to schemes, courses for returners - Mentoring links - Links to networks and other organisations - Links to academic grants and fellowships
Intended outcomes, effect	<ul style="list-style-type: none"> - Promotion of SET for girls and women - Support to women in SET by providing networks - Create a central centre of information and resource
Evaluation	N/A
Sources/references	http://www.theukrc.org/wise

31i. European Database of Women Experts in Science, Engineering and Technology	
Country/region	UK (Sweden, Germany, Netherlands and Spain also involved)
Level of intervention	International
Who is driving it?	WiTEC UK (Sheffield Hallam University) originally gained funding from the European Commission (DG V) in 1996 to develop the database. The database also received funding from the Promoting SET for Women unit in the Office of Science and Technology, Department of Trade and Industry (DTI) to re-design and update the database
Sector focus	SET general
Target group	Women in SET in Europe

	Persons interested in knowing about leading figures in various fields of SET
Type of initiative	Database to raise awareness of skills and knowledge of women in SET
Description of initiative	The European Database of Women Experts in Science Engineering and Technology was originally developed in 1997 as the first initiative of its kind in Europe to be used as a tool to raise awareness of the skills and knowledge of women in science, engineering and technology. It is a valuable tool for the media, government, schoolteachers and others who are keen to locate and refer to key women who are respected figures in their fields.
Activities	Database
Outputs	Database containing information on leading figures in various fields of SET
Intended outcomes, effect	Increased awareness of the skills and knowledge of prominent European women in SET
Evaluation	N/A
Sources/references	http://cemu10.fmv.ulg.ac.be/WITEC/intro.htm

31j. Portia	
Country/region	UK
Level of intervention	National
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET general - Aimed at all public, academia & industry
Target group	Women in SET in the United Kingdom
Type of initiative	Web-based resource to promote access to field, participation of women in SET
Description of initiative	<p>The purpose of Portia is to provide a gateway into SET for women of all ages and backgrounds, as well as organisations and institutions, to improve participation of women in SET.</p> <p>In 1998, seventy one women's organisations participated in the "Getting Connected" workshop sponsored by the Department of Trade and Industry. The outcome of that meeting was Portia, a web-based community, providing links to partner organisations, information on jobs, meetings and events and a forum for airing general concerns about women in SET and any other current topics, a learning section as well as a collection of fun topics we hope will appeal to all ages.</p>
Activities	<p>Networking, information-sharing. There is a range of resources on the web site including:</p> <ul style="list-style-type: none"> - Links to articles, reports and commentary of interest to women, with emphasis on gender issues in SET - Jobs, careers and mentoring - Courses and research - Conferences, workshops and meetings

	<p>Specific project:</p> <p>Equalitec: Advancing Women in ITEC (Information Technology, Electronics and Communications):Equalitec - Advancing Women in ITEC is a 3 year project funded under the Equal Programme from the European Social Fund (ESF) running from 2004-2007. At a time when the ITEC sector is facing severe skills shortages, women still only represent 23% of the workforce. As ITEC can offer many opportunities and paths for career development, which should suit women whose careers have been affected by maternity or unemployment, it is clear that an opportunity exists for the integration and reintegration of women. Equalitec intends to meet this challenge by tackling the barriers to recruitment, retention and progression of women in ITEC. It will develop and evaluate innovative ways to help achieve the successful reintegration of women into the workforce, and to mainstream the project outcomes.</p> <p>Reintegration & Progression:</p> <ul style="list-style-type: none"> - Development and delivery of training modules for women returners in the ITEC sectors and career women in ITEC Placement scheme for women returners - ITEC Mentoring Circles for Women returners and female students - Research on the needs of women returners in the ITEC sector (including perceptions and attitudes towards innovation and work-life balance) - Gender National Award: Innovative Women <p>Recruitment:</p> <ul style="list-style-type: none"> - Development of an ITEC careers portal for women - Development of an ITEC careers guide for women in HE (strong emphasis on ethnic minorities) - Work-shadowing scheme for female students - 30 women returners going back onto employment/ setting up in business
Outputs	<ul style="list-style-type: none"> - Links to articles, reports and commentary of interest to women, with emphasis on gender issues in SET. - Jobs, careers and mentoring links - Courses and research - Conferences, workshops and meetings - Placement and work-shadowing scheme - Information on the needs of women returners in the ITED sector - Gender Award - ITEC Career guide for women in HE - Returners going back onto employment/setting up in business
Intended outcomes, effect	Improved participation of women in SET by providing a gateway into SET for women of all ages and backgrounds, as well as organisations and institutions
Evaluation	N/A
Sources/references	http://www.portiaweb.org.uk/

31k. UKRC Return Scheme	
Country/region	UK
Level of intervention	National
Who is driving it?	Public service: Originally the Department of Trade and Industry, The Office of

	Science and Technology, UK government – now under - Department for Innovation, Universities and Skills (DIUS) which falls under the Department of Business, Innovation and Skills Administered by UKRC
Sector focus	SET
Target group	SET returners
Type of initiative	Online training course - Participation and retention of returners to SET
Description of initiative	The UKRC recognises that for women who have studied or worked in science, engineering or technology (SET) and are looking to return to work in one of these sectors, developing a back to work strategy is essential. The Open University was therefore asked by the UKRC to develop a course to enable women to plan their return to work in SET. This online course, known as the <i>T161: Return to science, engineering and technology</i> offers a supportive environment to help you realise your ambitions. Through a series of web-based activities and online discussions, you'll analyse your previous experiences and skills, identify new employment opportunities, and develop a powerful action plan that will help you fulfil your aspirations and suit your lifestyle. As well as developing your skills and confidence, the course includes the chance to learn from role models and mentors from SET industries.
Activities	<p>The first part of this ten-week course is spent reflecting on what you have achieved so far and developing your CV using the Open University's electronic portfolio system. The next section enables you to explore the employment trends and opportunities within your specific area of interest, including accessing support from industry experts and mentors. During the final section of the course, you will produce a powerful action plan to help you achieve your future goals.</p> <p>Throughout the course, you'll learn techniques and skills to help you with networking, finding job opportunities and writing applications. The course is studied entirely online and you will not have an individual tutor, so you will need a computer and access to the Internet (preferably broadband). Many of the activities are carried out collaboratively online with other participants on the course through student self-help conferences. There is also an end-of-course assessment, which you must submit online.</p> <p>The UK Resource Centre for Women in Science, Engineering and Technology also offer a limited number of bursaries for the T161 to women who wish to return to work in science, engineering and technology.</p>
Outputs	Online training course
Intended outcomes, effect	<ul style="list-style-type: none"> - Through a series of web-based activities and online discussions, potential returners will be able to analyse their previous experiences and skills, identify new employment opportunities, and develop a powerful action plan that will help them fulfil their aspirations and that suits their lifestyles. - Develops potential returners skills and confidence - Opportunity for potential returners to learn from role models and mentors from SET industries.
Evaluation	N/A

Sources/references	No active link – online course no longer on offer
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311. Jive Partners	
Country/region	UK
Level of intervention	National – policy and practice
Who is driving it?	Funded by the European Social Fund UK national partnership led by the UKRC Public, supported by industry and academia
Sector focus	SECT (Science, Engineering, Construction and Technology)
Target group	SECT returners, women in SECT careers, SECT employers
Type of initiative	Partnership of organisations in pursuit of equal opportunities & participation for women in SECT
Description of initiative	<p>A five-year project that has addressed occupational segregation in the Science, Engineering, Construction and Technology (SECT) sectors. JIVE is a partnership of organisations across the UK which has developed new ways to tackle the issues of the under representation of women in SECT sectors, across education and industry. JIVE has influenced thousands of people throughout the partnership – young women choosing the subjects they study; careers professionals changing the advice they give; lecturers adapting how they teach; employers changing their company policy and practice; women choosing to return to work in science, engineering, construction and technology.</p> <p>The Project Partners deliver across seven key objectives:</p> <p>Women SECT Returners: <i>To empower and enable a minimum of 600 qualified women to return in SECT employment using a variety of tools (modular re-entry programmes, technical upskilling, fellowships, employer placements and support through networking and mentoring). We will also provide additional upskilling for those already in the industries (80 women) This will reduce the loss of expertise in SECT areas and making talent available to the sectors and meeting the economic priority of returners. JIVE has currently helped over 1034 women in their efforts to return to SECT industries using a variety of initiatives, including events, networking, information material, mentoring services for the wide range and volume of women engaged by the campaign, work experience/work shadowing which allows women to re-familiarise themselves with their chosen field or just the work environment itself</i></p> <p>Networking & Mentoring: To provide support to women through networking and mentoring, strengthening existing membership organisations, and embedding mentoring in identified SECT Sectors. This includes support to women seeking to set up their own enterprises. It is important to provide support to women throughout their SECT career life cycle, and networking and mentoring can be a very valuable resource.</p> <p>Employer Consultative Services: To engage a minimum of 150 employers in consultative services in how to implement gender equality in their HR practices for the participation and advancement of women. This includes industry, academia, research councils and sector skills councils. We will offer a range of gender</p>

	<p>equality tools (culture analysis tool, work life balance, company mentoring, returners schemes) and support progress to achieving good SECT employers. This fights discrimination and perceptions held by employers and tackling vertical and horizontal segregation.</p> <p>National Resource Centre: Two National Resource Centres have been set up in Wales and Scotland to ensure that the work of the partnership is continued, to include local initiatives. The centres offer information based on extensive mapping of positive action opportunities and funding opportunities in the respective countries, and levels of participation of women in SECT occupations in the region/country. The centres also offer advisory services and best practice solutions to employers and women in the respective countries.</p> <p>SECT Employment Pathways: To develop employment pathways for women in SECT from school to work by building local collaborative partnerships in three regional centres (Yorkshire & Humber, North West or East and the South East) and Wales, between combinations of organisations drawn from schools, colleges, universities, work based learning providers (Sector Skills Councils, Learning & Skills Councils, SETPoints, Welsh Assembly, Higher Education Institutions and employers). To explore the barriers to progression in SECT for women from school to work and from craft to professional levels. To mainstream recruitment, retention and progression initiatives within the partnerships.</p> <p>Regional Hubs : Three regional hubs have been developed to ensure the national work of the project is rolled out at a local level. These hubs have worked with local employers, schools and colleges to raise awareness of alternative careers, promote good HR practice within SECT organisations, and increase the number of female apprentices.</p> <p>Raise the Profile of Women: To raise the profile of women in SECT to breakdown gendered occupational assumptions, challenge parental attitudes and empower women to remain and progress in the sectors, using innovatory media products, such as documentaries and TV drama, and sector champions, profiling role models and identifying and promoting experts.</p> <p>Underpin the Project Activities: To underpin the project activities through research, development, products and evaluation.</p>
Activities	<i>Dissemination events, conferences, publications such as case studies, good practice guides; newsletters; DVDs; role model profiles; training material, information material; research reports and posters</i>
Outputs	<p>The results of these initiatives are:</p> <ul style="list-style-type: none"> - Regular contact and support to returners - Networking & Mentoring programmes and opportunities - Services for employers

	<ul style="list-style-type: none"> - Resource Centres in Wales, Scotland - Raised profile of women in SET - Various research projects and reports - Product and resources include good practice guides, case studies & role models, information & training material, newsletters and DVDS
Intended outcomes, effect	<ul style="list-style-type: none"> - Decline in occupational segregation in the Science, Engineering, Construction and Technology (SECT) sectors - Increased representation of women in SECT sectors, across education and industry - Qualified women returning to SECT employment - Support to women working in the SECT sectors - Engaged employers in consultative services in how to implement gender equality in their HR practices - Employment pathways for women in SECT from school to work - Raised profile of women in SECT - Produce research that will underpin all project activities
Evaluation	N/A
Sources/references	http://www.jivepartners.org.uk/index.htm

32. Women in Higher Education Register	
Country/region	UK
Level of intervention	National
Who is driving it?	Public and academia
Sector focus	HE
Target group	Women in higher education in the United Kingdom
Type of initiative	Web-based resource Support and promote women in higher education
Description of initiative	<p>The Register seeks to support and promote women in higher education via networking opportunities, career and personal development workshops. The register provides information on women in Higher Education and their:</p> <ul style="list-style-type: none"> - Education, qualifications, skills and skill shortages - Employment and career patterns including promotion within and outside Higher Education - Pay levels - Areas of special interest, publications. and current research - Membership of professional, national; and regional bodies/committees
Activities	<p>Database, information-sharing, career and personal development, advocacy</p> <p>The Women in Higher Education Register offers:</p> <ul style="list-style-type: none"> - Resources and opportunities for networking with other women in Higher Education - Career and personal development workshops - A base for raising the profile of women in Higher Education, and - Assistance for participating in decision making and influencing forums
Outputs	Register with information on HE women, links to resources and networking opportunities; career and personal development workshops
Intended outcomes, effect	Increased support and promoting of women in higher education via networking opportunities, career and personal development workshops
Evaluation	N/A
Sources/references	No active link – register inactive

33. Women's Engineering Society (WES)	
Country/region	Headquarters in the United Kingdom
Level of intervention	National – implementation
Who is driving it?	Industry
Sector focus	Engineering
Target group	Women engineers in the United Kingdom
Type of initiative	Non-profit organisation/Society. The Society works to help women engineers to meet and exchange ideas on common interests, training and employment.
Description of initiative	WES was formed in 1919 when women engineers were a new breed in a male dominated environment. Because of their own sense of isolation, early members wanted to help women engineers to meet and exchange ideas on common interests, training and employment.
Activities	<p>Information-sharing, journal, conferences, networking, funding awards</p> <p>Activities:</p> <ul style="list-style-type: none"> - Promotes the education, training and practice of engineering among women - Increases public awareness of the contribution women can make to engineering - Provides a forum for the exchange of opinions and experience respecting education, training and employment for women with interests in engineering - Sustains contacts with women engineers on career breaks and facilitates their return to paid employment by keeping them informed of progress within the profession - Ensures the voice of women engineers is heard during the deliberations of Government and policy-making institutions - Raises the profile and effectiveness of women engineers by forming links and networking with other women's organisations
Outputs	<p>Products and services:</p> <ul style="list-style-type: none"> - WES quarterly journal - The Woman Engineer carries articles of technical interest, reports on WES activities and concerns nationally and internationally, profiles of women engineers. - WES Annual Conference-includes talks and workshops on working life in general as well as on engineering. Marketing technology, career development, engineering for a better environment, time management, recruitment and promotion have been recent issues of interest. - Local Circles - informal groupings at regional level - University Groups- informal groupings in Universities - WES Company Membership-supports and encourages women engineers and their employers within the workplace. - Continuing Professional Development - the WES Conference and some local activities are approved for CPD purposes by most of the Engineering Institutions - Expert Speakers - to schools and careers conventions - Expert input - to Government and other policy making bodies. - WES members play an active part in the Daphnet email list for women in science, engineering and technology. <p>WES awards: <i>WES Lady Finnieston Awards</i> are made to enable women, who otherwise might be prevented from doing so on grounds of hardship, to take up places on and begin recognized engineering degrees or HND courses in British Universities and colleges. Awards are primarily one-off, though repeat funding may be available in some cases. Typical awards are currently between £500 and £1000.</p> <p><i>The Karen Burt Memorial Award:</i> An annual Award to encourage more women to aim for Chartered Engineer and corporate status. Officially launched on 3 November 1998 by The Women's Engineering Society, the Karen Burt Memorial Award is made annually to a woman engineer of</p>

	high caliber who has newly attained full corporate membership and Chartered Engineer status through her relevant Institution. The award not only recognises the candidate's excellence and potential in the practice of engineering and highlights the importance of Chartered status, but also gives recognition to contributions made by the candidate to the promotion of the engineering profession.
Intended outcomes, effect	<ul style="list-style-type: none"> - Networking amongst women engineers regarding common interest, training and employment. - Increased awareness and participation in the education, training and practice of engineering among women - Increases public awareness of the contribution women can make to engineering - Facilitation of returners to paid employment by keeping them informed of progress within the profession - Representation of women engineers during the deliberations of Government and policy-making institutions - Raised profile and effectiveness of women engineers
Evaluation	N/A
Sources/references	http://www.wes.org.uk

33a. Mentorset	
Country/region	UK
Level of intervention	National
Who is driving it?	Industry: Women's Engineering Society
Sector focus	SET general
Target group	Women in SET
Type of initiative	<p>A national mentoring scheme for women in Science, Engineering and Technology</p> <p>Support – career development and access to senior positions</p>
Description of initiative	<p>A mentoring scheme started in 2002 to help women working in SET. They provide independent mentors who understand the challenges faced and who can provide support and advice. Aims to increase the number of women who can mainstream their SET careers, and realize their full potential.</p> <p>MentorSET has a number of affiliated groups: Women's Engineering Society, Cambridge Awise, Women in Physics from the Institute of Physics, BCSWomen, Daphne Jackson Fellows, women@cl</p> <p>Mentees must be a member of one of these groups but there is no restriction for mentors.</p>
Activities	Mentoring
Outputs	Support to women in SET through mentoring
Intended outcomes, effect	Women in SET careers mainstreaming and utilizing their full potential
Evaluation	N/A
Sources/references	http://mentorset.org.uk

34. Daphne Jackson Trust	
Country/region	UK
Level of intervention	Institutional & grassroots level

Who is driving it?	Independent charity
Sector focus	SET
Target group	Returners scheme helping those with a background in science, engineering and technology to return after a career break
Type of initiative	Award and funding scheme
Description of initiative	The Daphne Jackson Trust is an independent charity which offers flexible, part-time, paid fellowships to scientists, engineers and technologists who have taken a career break of two or more years for family, caring or health reasons. Its work has been highly praised by Government and it is acknowledged as running the foremost returners scheme in the country. The Daphne Jackson Trust is continually working to address the problem and make everyone aware of the importance of returning SET professionals to their full potential in research careers. Applicants have to be UK resident and intend to stay in the UK. Applicants must have a first degree in a SET discipline and at least three years work experience before a career break.
Activities	Fellowships are normally two years in length and based at universities and industrial laboratories throughout the UK. Fellows undertake a challenging research project and a retraining programme. Fellows are offered support, guidance and mentoring throughout the application process and Fellowship.
Outputs	Support, guidance, mentoring, financial assistance
Intended outcomes, effect	The Trust does not guarantee employment, however, it removes the disadvantage of a career break and on completion Fellows are able to compete for employment with their peers on a level playing field
Evaluation	The Trust has a 96% success rate in returning Fellows to science, engineering or technology careers
Sources/references	http://www.daphnejackson.org/

35. The University of Cambridge Women in Science, Engineering and Technology Initiative (WiSETI)

Country/region	UK
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	SET in HE
Target group	Women in Science in HE
Type of initiative	University based organisation: Improve representation of women studying SET, the recruitment, retention and promotion of women in SET, to raise profile and enhance self-confidence of women in SET

Description of initiative	<p>A Cambridge University Initiative for Women in Science, Engineering and Technology (SET) was established in March 1999, a development of the Secretary General's Women in Science Group set up in 1993, to consider strategies for increasing the representation of women in science in the University. WiSETI's focus is:</p> <ul style="list-style-type: none"> - improve the numbers of women studying SET at Cambridge - to improve the recruitment, retention and promotion rates of women in SET appointments and - to raise the profile and enhance the self-confidence of women in SET through a range of initiatives. <p>WiSETI addresses:</p> <ul style="list-style-type: none"> - access - recruitment and admissions - participation - retention of women graduate students and post-docs - progression - the career progress of women post-docs into permanent posts and their retention if they choose to have children or have to undertake other caring responsibilities - performance - whether women are required to outperform men in order to win research funding or appointments
Activities	<p>WiSETI has played a key role in highlighting the issue of the under-representation of women in SET. It successfully introduced dialogue between the different agencies in the university (where undergraduates are admitted by Colleges) concerned with outreach to school students. The projects undertaken in WiSETI's first phase, 1999 to 2001 - Springboard for Undergraduates, mentoring for women in SET and raising awareness among male scientists, were designed to complement existing initiatives in the university and to extend innovative and good practice. Its main strands are:</p> <ul style="list-style-type: none"> - MentorNet - an email mentoring programme for women undergraduates - a recruitment programme - an annual WiSETI lecture - a Code of Practice and best practice guides for the SET workplace - careers talks for undergraduate women from speakers with a high profile in their own industries, sponsored by Citigroup <p>MentorNet: an email mentoring programme for women undergraduates: <i>Following a successful mentoring pilot for Contract Research Staff, which was supported by training for both mentors and mentees; mentoring is now incorporated into the draft Code of Practice for laboratory disciplines. MentorNet is a complementary ongoing project which taps into an American e-mentoring scheme, pairing industrial, commercial and government/civil service mentors with women SET students.</i></p> <p>A recruitment programme: <i>In the first phase of this programme, two recruitment officers were appointed to act as head-hunters, to identify potential women candidates in SET and ensure they receive appropriate information about positions that may interest them, track the progress of women candidates, advise and support appointments committees in evaluating women's CVs, and run workshops on gender bias and gender equality issues for senior academics to bring out subtle differences in expectations for men and women and challenge institutional culture and values in a positive way. Dr Esther Haines is continuing</i></p>

	<p><i>the programme with an emphasis on identifying, supporting and disseminating good practice.</i></p> <p><i>WiSETI lectures: An annual WiSETI lecture by a high profile woman scientist is part of outreach to girls and women who may be interested in science.</i></p> <p><i>The Springboard programme: The University and the Springboard Consultancy jointly developed the Springboard for Undergraduates programme for women in science. The pilot for second year undergraduates was so successful that the University opened the programme to all undergraduates and published a new design workbook. The programme provides a 'toolkit' for building confidence, taking control and emphasising the need for each student to develop strategies for changes that are in tune with her own personal values and aspirations.</i></p> <p><i>Citigroup sponsorship: On 15 January 2004, the University announced a new form of partnership with the Citigroup Foundation, long a valued supporter of Cambridge. The Foundation has awarded \$200,000 over two years to the University in support of a newly designed undertaking to aid undergraduate women studying at Cambridge.</i></p> <p><i>Careers events: WiSETI and Citi invite all women undergraduates to attend Careers Events by women in finance, science, technology and business. There will be three speakers at each event. The talks are followed by Questions and Answers and a Reception.</i></p>
Outputs	<ul style="list-style-type: none"> - Dialogue between different agencies in the university concerned with outreach to school children - MentorNet: an email mentoring programme for women undergraduates - A recruitment programme offering information on appropriate positions, tracks the progress of women candidates, advise and support, workshops on gender bias and gender equality issues - WiSETI lectures by high profile women scientists - The Springboard programme for undergraduate women in science offering a toolkit for professional and career development - Financial support and sponsorships - Careers events
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased representation of women in SET at Cambridge - Increased number of women studying SET at Cambridge - Improved recruitment, retention and promotion rates of women in SET appointments at Cambridge - Raised profile of women in SET - Enhanced self-confidence of women in SET - Increased retention of women graduate students and post-docs
Evaluation	No formal evaluation – but results seem to be showing impact
Sources/references	http://www.admin.cam.ac.uk/offices/personnel/equality/wiseti/

36. North West University Mentoring Scheme (MENWU)	
Country/region	UK
Level of intervention	Institutional – across institutions
Who is driving it?	Academia
Sector focus	SET in HE
Target group	Women in SET in HEI management

Type of initiative	University based initiative: Increase participation of women in HE management structures
Description of initiative	MENWU aims to provide women with the confidence to take on more prominent/influential roles within their HEI's management structure, where they can have an impact on policies and procedures. In turn, it is hoped that this will lead to changes of attitude and culture.
Activities	<p>Mentees are mentored by someone external to their own HEI. The number of mentoring partnerships is expected to be between 40 and 50. The mentoring relationship will last around eighteen months with meetings once every six to eight weeks. Many features of the pilot are being incorporated, for example the pilot showed the importance of mentor mentee matching. Subject area was not the most important criterion, it was more important to match the primary job function e.g. research or management. Other factors to be taken into consideration, where possible, are location; relative ages of mentors and mentees and family responsibilities; likelihood/experience of career breaks and part-time work.</p> <p>The pilot also showed the importance of training. Mentors are offered a one-day workshop designed to: enable participants to explore the purposes, role and responsibilities of mentoring, anticipate and prevent the pitfalls of mentoring, develop awareness / sensitivity to the social and emotional climate that is conducive to good mentoring, establish and maintain high quality and effective mentor mentee relationships.</p> <p>Initial mentee briefing meetings include discussion of mentees' expectations, what they hope to achieve by participating, how to prepare for meetings with their mentor and a learning exercise in reflection. All mentors and mentees are required to sign a contract of confidentiality before the mentoring process begins.</p>
Outputs	<p>Mentoring relationships across HEI that last around eighteen months with meetings once every six to eight weeks</p> <p>Mentor training workshops.</p>
Intended outcomes, effect	<p>For mentees:</p> <ul style="list-style-type: none"> - improved research, personal and career development plans - career enhancement - increased self-confidence, motivation, assertiveness and determination - critical self-appraisal and career planning - enhanced networking opportunities - reduced feelings of isolation in male dominated environments <p>For mentors:</p> <ul style="list-style-type: none"> - expanded networking opportunities - support from other mentors - renewed self-confidence - enhancement of interpersonal skills - satisfaction from assisting in the career development of mentees - new perspectives <p>For institute:</p> <ul style="list-style-type: none"> - the development of staff enabling them to contribute fully to their organisation - the increased motivation of their staff

	<ul style="list-style-type: none"> - the creation of networking opportunities for collaborative research proposals - providing evidence of commitment to equal opportunities - having senior academic women act as role models for female students (which, in turn, has a significant influence on the latter's subsequent career choice).
Evaluation	Initial evaluation was positive – however does not seem that was duplicated and followed-through
Sources/references	http://www.athenaforum.org.uk/CaseStudy1.htm

IRELAND

37. Women in Technology and Science (WITS)	
Country/region	Ireland
Level of intervention	National – policy & practice
Who is driving it?	Industry and academia
Sector focus	Science and technology
Target group	Women in SET in Ireland: students, senior public, private and academic scientists
Type of initiative	Non-profit organisation/Association promoting participation, networking
Description of initiative	<p>WITS works to promote women's participation in SET primarily via a range of networking activities. WITS was inaugurated in November 1990. The association has members from a broad range of scientific, engineering and technological backgrounds including teachers, computer experts, technicians and journalists. WITS members range in age and experience from third level students to some of the country's most senior scientists and academics. Individual membership is open to women throughout Ireland who work, have worked or who are studying in any area of science, engineering or technology.</p> <p>Current projects:</p> <p>A seat at the table-Talent Bank: WITS has published a list of qualified women in Ireland willing to provide consultation and participate in public committees in the fields of Science and Technology.</p> <p>Jobs for the Girls-Role Model Project: Project to develop a role model booklet and pack to be used by third level institutes to introduce secondary school girls to women working in the areas of science, engineering and technology. Project funded by Dept. of Education. A new career guidance CD for school girls, featuring women role models with exciting and varied careers in science, engineering and technology. Meet a poisons expert who works as a health and safety inspector, a forensic scientist who helps solve crimes, an engineer who has designed power systems for space satellites, a meteorologist with a special interest in sea conditions, and a software developer who is fluent in several (computing) languages. These are just some of the 40 women featured in a new career guidance CD, produced by WITS. The Role Model CD-Rom, profiling 40 women role models has been sent to all post-primary schools in the country. The aim of the project is two fold:</p> <ul style="list-style-type: none"> - The overall objective of the project is to increase the number of secondary school girls who can experience a role model day by

	<p>increasing the number of role model days run by colleges. This can be achieved by disseminating a Role Model Pack to third level colleges. The pack will be a resource for colleges wishing to run their own Role Model Seminars.</p> <ul style="list-style-type: none"> - To produce a resource to inform and interest girls in careers in science and technology, in the form of a Role Model Booklet. The booklet is also for the use of teachers, especially career guidance counselors and S&T teachers. <p>Plaques Project: This project aims to raising public awareness of Irish women scientists' contributions by erecting plaques in public places to draw attention to their achievements.</p>
Activities	<p>Networking, information-sharing, policy analysis, database</p> <p>The purpose of the Association is to actively promote women's participation in Science & Technology by:</p> <ul style="list-style-type: none"> - Enabling women scientists and technologists to meet and correspond - Providing a support and information network for women working in science and technology - Promoting co-operation between women scientists and technologists in all aspects of scientific and technological endeavour - Holding and promoting meetings on subjects relevant to the interests of women in scientists and technologists - Informing public attitudes on the participation of women in science and technology - Encouraging the participation of young women in science and technology - Promoting the investigation of the role and influence of women in Irish science and technology - Examining science policy and its implications for women scientists and technologists, and - Establishing links with existing scientific and technological organisations and with groups promoting women in enterprise and equality for women. In establishing such links due account will be taken of the interests of all WITS members and any such links will be of benefit to all within the WITS membership.
Outputs	Various reports, links, meetings, etc
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased participation of women in S&T – younger women and established women - Increased support for women in S&T - Increased cooperation between women scientists and technologists
Evaluation	N/A
Sources/references	http://www.witsireland.com/

38. Principal Investigator Career Advancement Award (PICA)	
Country/region	Ireland
Level of intervention	National, Institutional
Who is driving it?	Government (Science Foundation Ireland)
Sector focus	Biotechnology, IT, sustainable energy, energy-efficient technologies
Target group	Returners
Type of initiative	Funding grants

Description of initiative	<p>The SFI Principal Investigator Career Advancement (PICA) Programme supports outstanding researchers returning to active research after either a prolonged absence, or those within the early consolidating stages of their independent research career. PICA has been integrated into the Principal Investigator programme.</p> <p>The SFI Principal Investigator (PI) Programme supports those fields of science and engineering that underpin biotechnology, information and communications technology, and sustainable energy and energy-efficient technologies. PI grants may range from €100,000 to €500,000 direct costs per year and may be 3-5 years in duration.</p> <p>PI programme objectives are relevant to PICA and are states as: to offer funding opportunities that focus on developing and enhancing internationally competitive research talent and excellence in Ireland; to provide funding opportunities that help third level institutions attract and retain world-class researchers in Ireland, to provide excellence in training and development for students and postdoctoral fellows, through state-of-the-art research opportunities with world class researchers and teams; to fund a period of intensive research to enhance the candidates' research and provide capacity and reputation to promote Ireland's participation in the international research forum.</p>
Activities	<p>An applicant wishing to apply to the SFI PI Programme must be an established independent investigator with an internationally recognised track record. Lead and co-applicants are reviewed equally in the SFI PI Programme. The applicant/co-applicant must hold a Ph.D./M.D. or equivalent for at least 8 years by the pre-proposal deadline. The applicant/co-applicant must be senior author (first, last or corresponding, or in those fields where alphabetic order of authorship is the norm, joint author) on 10 International peer reviewed articles. Only original research publications, and not review articles, are acceptable. Applicants must demonstrate a proven record of internationally recognised independent research accomplishments. Applicants are expected to have demonstrated research independence through securing at least one independent research grant as lead investigator or as co-investigator. Applicants are expected to have the capability and authority to mentor and supervise postgraduate students and team members. PICA applicants have to adhere to the above criteria and fall within one of the following categories:</p> <ul style="list-style-type: none"> - <i>Category 1:</i> Any applicant who has taken consecutive documented eligible leave (minimum 18 weeks) since 1st January 2003 and have since returned to work. This can include, but is not limited to statutory adoptive leave, statutory parental leave, statutory maternity leave, statutory paternity leave, career's leave, long-term medical illness leave, conscription - <i>Category 2:</i> Permanent or contract academic staff who have returned to an academic research position since 1st January 2006, having worked for a minimum of 2 years in a science or engineering-related industry. - <i>Category 3:</i> It is recognised that some early-career-stage independent investigators may have an excellent publication record evidenced by high-quality publications. Therefore, SFI will consider grant applications

	<p>from exceptional investigators provided that they are 8 to 12 years post-PhD., and have 5 or more publications of excellence.</p> <p>In order to allow enhanced focus on research activities, successful PICA applicants under Category 1 will be entitled to request funding for teaching buyout of up to 50% of their teaching load for a period of up to 24 months from the start of their grant. Such a request must be made at the time of application, and should be included in the budget and detailed in the budget justification. Requests for teaching buyout post-application will not be entertained by SFI. The teaching buy-out component only applies to those within Category 1.</p>
Outputs	Funding grants
Intended outcomes, effect	Supports and retention of outstanding researchers returning to active research after either a prolonged absence, or those within the early consolidating stages of their independent research career.
Evaluation	N/A
Sources/references	http://www.sfi.ie/funding/funding-calls/closed-calls/sfi-principal-investigator-career-advancement-award-pica/

39. Centre for Women in Science & Engineering Research (WiSER) (Trinity College Dublin)	
Country/region	Ireland
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	SET
Target group	Women working in SET, policy and decisionmakers
Type of initiative	Advocacy and lobbying, monitoring, training and development
Description of initiative	<p>WiSER works to recruit, retain, return and advance women in academic science, engineering & technology (SET). WiSER's mission is to develop sustainable practices to ensure that women's scientific expertise, knowledge and potential are recognised and harnessed to fully contribute to a diverse, innovative and productive scientific community of global consequence. To realise our mission , we aim to:</p> <ul style="list-style-type: none"> - Monitor and report annually on the position of male and female researchers in the science, engineering and technology (SET) disciplines - Increase the retention of women by providing direct support to women researchers and academics in science and engineering - Encourage the provision of an environment in which highly-skilled women scientists have access to the opportunities and support necessary to advance to senior and decision-making positions - Create a sense of community within the workplace and the field as a whole by facilitating networking amongst the vibrant population of scientists - Stimulate institutional and cultural change in order to create a more gender-balanced and innovative working environment <p>WiSER's activities and practices are underpinned by the core value that scientific excellence is only achievable in an environment that supports, enables and sustains all outstanding researchers, regardless of gender, so that they can make full use of their skills and knowledge. Such an environment can create the</p>

	opportunities and conditions necessary for the pursuit of world-class research which will benefit Ireland's reputation as a centre for innovation.
Activities	<p>The WiSER theoretical model positions all our actions under three main approaches: Tinkering, Tailoring and Transforming These equality approaches focus on <i>legislation (tinkering)</i>, <i>positive action (tailoring)</i> and <i>gender mainstreaming (transforming)</i>.</p> <p><i>Tinkering</i>: Establishes formal equality between the sexes with a focus on legislation, rules and procedures in order to ensure that men and women are treated equally. Aims to remove discrimination which would lead to unequal treatment. To engage with relevant equality policy and legislation in order to do so.</p> <p><i>Tailoring</i>: Recognises that differences exist between women and men, which are due to a complex range of cultural, historical and socio-economic reasons and have led to unequal choices of and access to careers. Attempts to ensure a "level-playing field" in the competition for jobs, promotions & career-advancement.</p> <ul style="list-style-type: none"> - Personal & Professional Development Programme: Springboard is an award-winning personal and professional development programme, designed and developed by women for women. It has been created specifically to enable women to achieve their full potential both at work and in their personal lives and to gain greater influence. Through a series of workshops and other activities, the Springboard programme can help you increase confidence, build on your existing strengths and make them work for you, set and achieve goals, be more assertive, and just connect and share experiences with a group of women who are in a similar situation to you. - Mentoring programme: The WiSER Mentoring Programme aims to retain scientific excellence in College by providing a one-on-one facility for professional and personal development and support to women academics; provide women with a structure which will encourage active decision-making about their careers and assist them in planning the next steps; and Create diverse communities across schools by connecting academics from varying disciplines The partnerships are mentee-led, and as such the topics covered and the pace maintained are driven by the mentee. - Career development workshops - Academic writing groups - Postdoctoral awards <p><i>Transforming</i>: Acknowledges that existing structures and institutions are not gender-neutral but favour one sex, usually men, often in invisible ways. Embraces the differences between men and women as bringing added value to the academic environment. Activities: Collect gender disaggregated statistics & report on them annually; Audit of good practice in University Schools (at planning stage); Gender awareness training (at planning stage); Policy & procedure review in context of gender.</p>
Outputs	Advocacy and lobbying activities, personal and professional development programmes, mentoring, writing groups, awards
Intended outcomes, effect	To recruit, retain, return and advance women in academic science, engineering & technology (SET).
Evaluation	N/A

Sources/references	http://www.tcd.ie/wiser/about/
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SCOTLAND

40. Scottish Resource Centre for Women in Science, Engineering and Technology	
Country/region	Scotland
Level of intervention	National
Who is driving it?	Academia, government
Sector focus	SET
Target group	Women in SET in all career stages
Type of initiative	Support, professional development, mentoring
Description of initiative	<p>The Scottish Resource Centre for Women in Science, Engineering and Technology sets out to create sustainable change for the participation of women in SET sectors throughout Scotland. We achieve this through (1) Changing employment practices and workplace cultures to support gender equality; and (2) Supporting the recruitment, retention, return and success of women where they are significantly under-represented.</p> <p>The Scottish Resource Centre is part of the Faculty of Engineering, Computing and Creative Industries at Edinburgh Napier University and also a partner of the UKRC, delivering UKRC services in Scotland.</p>
Activities	<p>We offer support to women at all stages of their career. Events are held across Scotland to help women become more positive, confident and to make informed career decisions. Services provided include:</p> <ul style="list-style-type: none"> - Interactive workshops covering topics such as public appointments; media training; career development and women entrepreneurs - Career-focused events through Interconnect for female students, helping them make links with industry and other female professionals - Receiving or providing mentoring and coaching support and advice - Equality and diversity training for students, apprentices and businesses - Consultancy services for businesses and organisations.
Outputs	<p>The Scottish Resource Centre, since 2005, has worked hard to promote gender equality for women in SET industries. Some of our achievements include:</p> <ul style="list-style-type: none"> - Worked with over 60 employers and organisations on equality and diversity issues in the workplace - Our career support services have been taken up by over 500 women - Our employment-focused student events have attracted over 230 women - Providing equality and diversity training to 530 Modern Apprentices and undergraduates - Producing valuable research into the attitudes and experiences of SET career entrants in Scotland. - Contributed to policy development via the Scottish Government National Economic Forum and Scottish Parliament committees
Intended outcomes, effect	Support for the recruitment, retention and success of women in underrepresented of SET in all stages of their careers
Evaluation	Various
Sources/references	http://www.napier.ac.uk/businessactivities/servicesforbusiness/src/Pages/Home.aspx

CZECH REPUBLIC

41. The National Contact Centre – Women and Science (nkc)	
Country/region	Czech Republic
Level of intervention	National – policy and practice
Who is driving it?	Public, academia and industry
Sector focus	R&D
Target group	Women researchers and HR policy makers
Type of initiative	National body - Contact Centre Equality in position of women in science, networking and support to women scientists
Description of initiative	<p>The Centre aims to contribute to shaping gender discourse in R&D, to shaping science policy and human resource policy in the Czech Republic, especially with respect to the position of women in science. It also functions as a place for various opinions and concepts to meet at the crossroad of scientific research and gender, and as a place where Czech female researchers can meet and exchange experiences.</p> <p>On an international level, the Centre has established close ties with Unit C-5 Women in Science at the Directorate for Science, Technology and Innovation, as well as with similar organisations. At present, the Centre is involved in the development of the European Platform for Women Scientists.</p>
Activities	<p>International projects and cooperation</p> <p>KNOWING: The research project is funded by the European Commission and will run for three years between 2006-2008, and is carried out by five national teams. The main objective of this project is to examine the contexts and cultures of knowledge production, including the role of gender, from an “East-West” perspective. Here we will study selected scientific institutions in the five partner countries that we will compare with and situate in the broader national contexts. In a combination of discourse analysis, participant observation and individual and group interviews, we will investigate the ways in which interactions between regional and national contexts and histories, hegemonic discourses, institutional politics and practices, affect the motivations, The research aims to:</p> <ul style="list-style-type: none"> - examine the production of knowledge contexts and cultures, including the role of gender, from an “East-West” perspective - identify structural and institutionalised practices and procedures, including standards of excellence, that hinder and/or promote the equal participation of women in science - encourage the establishment of feminist science studies in the partner countries, especially in the new EU member states - influence policy on higher education and research and development at the national and EU levels in order to promote gender equality and increase the engagement of young people in science research interests, epistemological frameworks, collaborations and career trajectories of women and men in science. <p>WS Debate: The WS DEBATE project is a Specific Support Action in the EU 7th Framework Programme. Its overall objective is the stimulation of policy and public debate on the situation and perspectives of women in science, in order to bridge</p>

	<p>the gap between policy developments and public understanding of the related issues, and raise gender awareness among policy makers, scientists, as well as among the lay public interested in scientific developments. This objective will be realised by encouraging a broad public debate based on the dissemination of the knowledge gathered by the Enwise report (Waste of talents: turning private struggles into a public issue – Women and Science in the Enwise countries; European Commission, EUR 20955 EN) in the countries of Central Europe (Czech Republic, Hungary, Poland, Slovakia, Slovenia). The project will support the process of implementing the Enwise recommendations, as well as contribute to the promotion of a dialogue on best gender equality practice in research and development by the publication of national reports on the situation of women in science and the organisation of conferences in each partner country.</p> <p>CEC-WYS: Central European Centre for Women in Science build upon the policies and activities of the EC, and expand on the experience of the National Contact Centre - Women in Science (NKC) in order to fulfill two primary goals:</p> <ul style="list-style-type: none"> - to promote, mobilise and network women in science in Central Europe, and - to promote, mobilise and network young people in science in the region and thus to contribute to increasing gender equality in R&D and to structuring the European Research Area. <p>The Centre involved partners from Hungary, Slovakia, Slovenia and the Czech Republic and will draw on the experience of partners from Romania, France and Italy. The project evolved following activities:</p> <p><i>Enwise follow-up activities in the Czech Republic:</i> In 2002, the European Commission commissioned a report on the situation facing women scientists in Central and Eastern Europe and the Baltic states from the ENWISE expert group. In June 2004 the report was made available, formulating recommendations to the European Union on women and science at national and European level. The four Central European partners of the project served as "watchdogs" by mapping, measuring and reporting to what extent the recommendations of the ENWISE Group have been implemented at national level. The reports are available here to download in the national language and English. The process of mapping and the end result contribute to lobbying for further improvements in the position of women in science at national level.</p> <p><i>Regional database of women scientists:</i> The unique, regional, multi-disciplinary, easily navigable database of women scientists' aims to address this situation by making highly qualified women scientists more visible. Women scientists can be searched for the purposes of project participation and invitation to advisory committees, boards and expert panels. It will also provide a source for networking for women in the region of Central Europe.</p> <p><i>The Project Sourcebook: Sharing Experiences - Building Projects</i> provides</p>
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	<p>assistance and advice on project coordination and management based on the experience of CEC-WYS, of writing and submitting proposals for the European Commission under FP6.</p> <p><i>Young Scientists workshop</i>, the international workshop organized by National Contact Centre and European Commission took place at Ministry of Education, Youth and Sports on April 25, 2003. The workshop was part of the ENWISE project of the European Commission, which aims to map the situation of women in science in Central and Eastern Europe, propose proceedings and develop a mechanism for progress evaluation in this area. Representatives of European Commission (Unit C-4 Young People and Science a Unit C-5 Women and Science), members of ENWISE expert group and young scientists from Central and Eastern Europe took part in the workshop.</p> <p>Spring School of Science Studies: By organising a working colloquium titled the Spring School of Science Studies, the National Contact Centre for Women and Science took strides toward developing reflection upon science and the scientific enterprise as a social phenomenon in the Czech Republic. The National Contact Centre for Women and Science invited members of several departments and fields (sociology, women's studies and social studies of science) from the University of Lancaster, UK.</p> <p>Women Scholars and Institutions conference: took place in Prague between 8th and 11th of July 2003. The conference was organized by the Research Center for the History of Sciences and Humanities and Commission Women in Science of the International Union of History and Philosophy of Science/Division of History of Science in cooperation with National Contact Centre – Women in Science, The Institute of Sociology of the Academy of Sciences of the Czech Republic, Centre for gender studies at Charles University, Faculty of Philosophy, and Slovak Academy of Sciences. 50 researchers and academicians from Western and Eastern Europe participated in the conference. The United States and China were represented as well. The Conference was especially focused on historical themes but included also gender and sociological papers.</p> <p>Ambassador Programme- People to People: A delegation of women scientists from United States of America visited the Czech republic as part of the Ambassador Program: People to people, a programme initiated by the government of the United States. The aim of the visit was to get information about participation and opportunities of women in science and support women in building their scientific career in the field of science and technologies by means of sharing experiences and contacts with Czech women scholars.</p> <p>Projects on national level</p> <p>Newsletter: The aim of the newsletter is to address the interested readers in</p>
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	<p>activities relating to science and gender issues. The newsletter includes articles on the cultural and historical relations of the position of women in science and presents important women who helped to shape science in history. A monthly Newsletter brings information on activities in science and research, conferences, grants and fellowships from a gender perspective.</p> <p>The Young Talents: The Young Talents project introduces young Czech scientists. The project focuses on experiences of young women scientists at the outset of their careers, asking them about their mobility experiences, plans for the future and issues of work-life balance.</p> <p>Context: journal for gender and science is a specialized quarterly dedicated to the issues of gender and science and their interlinks. The name of the journal reflects the fact that major theories of the past thirty years build</p> <p>Infomat: Information about study opportunities, grants, fellowships and links to websites with specialized literature.</p> <p>The Nights of the Scientists: Each September NCC-WS arranges a meeting of the scientists and the public. In 2005, the topic field was sleep and somniation, in 2006 memory of the places and this year we invited successful women scientists to give talk about the time of communism, beginnings and development of their carrier and about their experience in science.</p> <p>Woman of the Month: Every month the Centre featured a new "Woman of the Month" on its website where we feature a prominent Czech scientist. The goal of the project was to give visibility to successful female scientists and at the same time to present them as role models for young female students and researchers beginning their scientific careers. Researchers were asked about their studies and scientific career, their work, how they have achieved their high-ranking position, the position of women and men in R&D, and how they harmonize family and work responsibilities.</p> <p>Seminars and lectures: The Centre organised regular Thursday seminars in spring and autumn 2003. The first series was dedicated to gender issues in science. The second series presented various gender research projects conducted in the Czech Republic. The primary target audience was experts. In 2004, we focused on discussions about students' thesis, which concerned gender issues.</p> <p>Work-life balance in the science: The Centre analysed situation in the Czech Republic concerning work-life balance in the science, legislative, examples of good praxis and arranged a conference, where the women scientists discussed their difficulties with the deputies of notable institutions of research and science in the Czech Republic.</p> <p>Fellowships of students from Department of Gender Studies (Faculty of</p>
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	Humanities, Charles University): The Centre as a partner of Department of Gender Studies provided a programme of students fellowships intended for the students of Master programme of Department of Gender Studies. This project was carried out due to funding of ESF, government of the Czech Republic, Prague City Hall and the Ford Foundation.
Outputs	Research reports, policy and public debate, networking opportunities, information dissemination, database of women scientists, project source book (sharing experience), workshops for young scientists, spring school of science studies, conference, ambassador program, newsletters, journal, information about study opportunities/grants/fellowships, profiling prominent female scientists, seminars, lectures.
Intended outcomes, effect	<ul style="list-style-type: none"> - Influencing gender discourse in R&D and science policy and human resource policy in the Czech Republic, especially with respect to the position of women in science. - Networking of Czech female researchers - Profiling of prominent Czech female researchers
Evaluation	N/A
Sources/references	http://www.zenyaveda.cz/html/index.php?s1=1&s2=7

SPAIN

42. Women and Science Unit (Ministry of Science and Innovation) (UMYS)	
Country/region	Spain
Level of intervention	National
Who is driving it?	Ministry of Science and Innovation
Sector focus	SET
Target group	Policy and decisionmakers
Type of initiative	Mainstreaming legislative arm
Description of initiative	<p>The Women and Science Unit of the Ministry of Science and Innovation, through the Minister's Office, is responsible for putting the principle of gender mainstreaming into practice in the fields of science, technology and innovation. The Ministry of Science and Innovation is therefore addressing the requirements of the Treaty of Amsterdam and Organic Law 3/2007 of 22 March on effective equality for men and women; two legal texts that establish mainstreaming as the principle underpinning political action in the area of gender equality. In accordance with the principle of mainstreaming, public authorities should consider the differentiating gender impacts and consider measures to actively promote equality between men and women throughout the process of defining, applying and assessing public policies in every stage of their development: legislation, policies, programmes, budgets, plans and projects.</p> <p>Based on the principle of mainstreaming, the Women and Science Unit is proposing and promoting the perspective of gender in science, technology and innovation policies that affect equality between men and women. It therefore: (1) Promotes the presence of women in all the spheres of science, technology and innovation, based on their merits and skills, establishing mechanisms for</p>

	eliminating bias, barriers and disincentives, (2) Promotes the inclusion of gender as a transverse category in scientific research, as well as specific research in the field of gender and women's studies and (3) Promotes the inclusion of gender as a transverse category in technological developments and innovation.
Activities	In order to promote gender equality through all the public organisations involved in research, technology and innovation the Women and Science Unit works in conjunction with the following, among others: Directorates-General of the Ministry, Public research bodies, State Secretariat for Equality, Ministry of the Presidency and the Ministry of Education, National Statistics Bureau, European Commission Scientific Culture and Gender Unit, Centres in the autonomous regions and local entities associated with science, technology and innovation, Equality units and vice-chancellors' offices for women's research, seminars and study institutes in universities, and Science and technology associations in universities.
Outputs	Mainstreaming
Intended outcomes, effect	Gender mainstreaming in SET legislation, policies, programmes, budgets, plans and projects.
Evaluation	N/A
Sources/references	http://www.micinn.es/portal/site/MICINN/menuitem.7eeac5cd345b4f34f09dfd1001432ea0/?vgnnextoid=e218c5aa16493210VgnVCM1000001d04140aRCRD

PORTUGAL

43. Portuguese Association of Women Scientist (Amonet)	
Country/region	Portugal
Level of intervention	National
Who is driving it?	Industry, academia
Sector focus	SET
Target group	Female scientists
Type of initiative	Association
Description of initiative	The Portuguese Women Scientists Association, enshrined in the Universal Declaration of Human Rights and in the European Constitution, promotes the equality and full participation of Portuguese women in all aspects of science, including all science, teaching, industry and administration. Association's main goals: To achieve full equality of rights and opportunities; To discuss the situation of women in science, divulge their rights and focus on all forms of existing discrimination; Increase the participation of women (52% of the population) in all productive form of human activity; Promote useful exchanges with other national and international organisations.
Activities	There are four types of membership: <i>Effective</i> - Portuguese and foreign scientists, with a Portuguese address, having a college degree with five years (minimum) of recognized scientific activity; <i>Aggregate</i> - Individual and collective members; <i>Honorary</i> - Personalities who have already contributed for equality of women in science and <i>Benemerital</i> .

	Also have library and international symposium every 2-3 years.
Outputs	Information collection and dissemination, networking opportunities, symposium
Intended outcomes, effect	Equality of rights and opportunities; Awareness-raising of the situation of women in science, divulge their rights and focus on all forms of existing discrimination; Increased participation of women in all productive form of human activity; Useful exchanges with other national and international organisations.
Evaluation	N/A
Sources/references	http://www2.dq.fct.unl.pt/qa/Amonet_Statutes_en%201.pdf

GREECE

44.Periktioni network of women scientists	
Country/region	Greece
Level of intervention	Greece and the whole Mediterranean, Balkan and Black Sea region
Who is driving it?	General Secretariat for Research and Technology
Sector focus	R&D
Target group	Women in R&D activities
Type of initiative	Network
Description of initiative	The creation of the Women Researchers Network Periktioni has the goal of mainstreaming gender into R&D policy, promoting equal opportunities for women in R&D activities, sensitizing the public and disseminating information. In 2006, the General Secretariat for Research and Technology created the Periktioni network, which serves women researchers and scientists in Greece and the whole Mediterranean, Balkan and Black Sea region.
Activities	It recently asked for a gender balanced quota system to be set up 'for the appointment of presidents and directors of research centres and institutes, as well as for women participating on research advisory bodies, evaluation committees and research teams'. In order to achieve this goal, the Periktioni network introduced an amendment to the new law on research and development.
Outputs	Advocacy and lobbying activities, information dissemination, awareness raising activities
Intended outcomes, effect	Mainstreaming gender into R&D policy, promoting equal opportunities for women in R&D activities, sensitizing the public and disseminating information
Evaluation	N/A
Sources/references	http://www.genderandscience.org/doc/CReport_Greece.pdf

45. Greek Women's Engineering Association (EDEM)	
Country/region	Greece
Level of intervention	Local/grass roots
Who is driving it?	Industry
Sector focus	Engineering
Target group	Female engineering students or qualified and registered engineers

Type of initiative	Association, networking and support, information dissemination
Description of initiative	<p>EDEM's members are qualified Greek women engineers (members of the Technical Chamber of Greece). Women students at Greek technical universities can be 'baby members' of EDEM and full members when they graduate. EDEM has approximately 1500 active members. Its aims include:</p> <ul style="list-style-type: none"> - promoting the principles of and creating provisions for equality between women and men in employment, education and society in general - researching the problems women engineers face and seeking solutions - improving terms and conditions for women practicing engineering as a profession - encouraging community awareness of employment opportunities for women in the traditionally male-dominated engineering professions - acting as an information point for women engineers on employment opportunities- this will be related to training and development programs aimed at enhancing women engineers' chances of employment - encouraging and promoting activities of women engineers beyond their professional sphere; e.g. cultural and artistic events.
Activities	<p>Promoting the principles of and creating provisions for equality between women and men in employment, education and society in general; - researching the problems women engineers face and seeking solutions; - improving terms and conditions for women practicing engineering as a profession; - encouraging community awareness of employment opportunities for women in the traditionally male-dominated engineering professions; - acting as an information point for women engineers on employment opportunities. This will be related to training and development programs aimed at enhancing women engineers' chances of employment; - encouraging and promoting activities of women engineers beyond their professional sphere; e.g. cultural and artistic events.</p> <p>Members of EDEM can be Full members (members of Technical Chamber of Greece), Baby members (female students of Higher Engineering Schools) and Members of Honor (nominated by the board for their support of EDEM and seen as distinguished amongst their peers and society)</p> <p>Past projects:</p> <ul style="list-style-type: none"> - WOMENG 'Creating cultures of success for women engineers', www.womeng.net (Website) - Tackling Stereotypes 'Maximizing the potential of women in SET', (Website) - PREFACE 'Preparing Female Students for Academic Entrepreneurship', (Website) - EQUAL I 'Teleworking' - EQUAL II 'Adoption of mechanisms and programs for life learning from the SME's - certification of educational parcels and recognition of acquired knowledge in the sectors of applications of information technology and technical professions' - Mellow: Life long Mentoring of Women in and/or towards technical jobs. - Win: Women in Network - INDECS - Potentials of Interdisciplinary Degree Courses in Engineering, Information Technology, Natural and Socio-Economic Sciences in a Changing Society - Altener -Women And Renewable Energy Sources
Outputs	Website (information dissemination), workshops, mentoring, networking, expositions, publications
Intended outcomes,	Equality between women and men in employment; improved terms and conditions

effect	for women practicing engineering as a profession; community awareness of employment opportunities for women in the traditionally male-dominated engineering professions; networking and support for women working in engineering; career and professional development for female engineers
Evaluation	N/A
Sources/references	http://www.edem-net.gr/en/edem.html

46. Empowering for a choice (IFAC)	
Country/region	Greece and Europe
Level of intervention	National and regional
Who is driving it?	European Union, industry, academia
Sector focus	SET
Target group	Young girls
Type of initiative	Information dissemination, mentoring
Description of initiative	The partnership addressed the issue of 'choice', and low female participation in SET. Our target group is young women in their high school years, in the process of selecting a degree and career path. The project focused on providing accurate information and present role models who can act as mentors for those young women, through the creation of an IT information system, which enables access to young women across Greece and other EU countries but also ensure sustainable results since it will be linked to the planning department (with responsibility for documentation and analysis for lifelong training) created by the coordinator, E.KE.PIS.
Activities	Studies conducted by each participating country, yielded documentation resources on status quo of women represented in SET, collected best practices and past projects experiences and present a comparative analysis. Furthermore the designed and developed IT information system is used as a tool for internal and external dissemination, and as the means through which role model cases are projected to the particular target group. Finally, the policy paper that was produced as a main result of the project, utilises the surveys and workshops outputs providing instrumental guidance for policy improvements, encouraging female participation and continuing employment in SET careers.
Outputs	The project held its two planned consortium meetings: third consortium meeting in Vienna on January 2008, fourth consortium meeting in Athens on June 2008. During the second period, IFAC project achieved to finalise the collection of material concerning best practices and past projects which was used as input for the policy paper. Role models were also finished and the consortium collected 21 fully exploitable 'role models' interviews from all participating countries. The consortium succeeded in finalising all the requested work for the content, design and format of the role models database. The consortium succeeded also in producing the publication of the final report titled 'Promoting young women in SET: lessons learned. a cross-national analysis of past research projects'. The IFAC project organised and hosted two public workshops as initially planned. The third public workshop was held in Vienna 17 January 2008, and was entitled 'Strategies

	and policies maximising the participation of young women in science, engineering and technology (SET)'. The fourth and final workshop was held in Athens on 1 July 2008, and was entitled 'Young girls towards SET: educational choices and career development. Results of the IFAC project' The IT infrastructure was more elaborated upgrading to its latest technological platform. The IT infrastructure serves as reference for the project, offers a collaborative internal area for partner's communication, and most importantly, has been developed to support the development of the IFAC community.
Intended outcomes, effect	Increase in number of young girls choosing to pursue studies in SET in Greece through exposure to accurate information and motivating role-models and the provision of IT platform for information sharing and networking.
Evaluation	The project concluded the internal evaluation task. The evaluation was conducted based on the methodology and the appropriate tools that were provided as outcomes from the first period. Furthermore the external evaluator conducted the work of the external evaluation, providing useful results for the outcomes, the strengths and weaknesses of the project as well as the opportunities and threats. The consortium followed the dissemination strategy and carried out successful dissemination activities in each participating country as well as in broader EU level. The project disseminated the second, third and fourth issue of the IFAC Newsletter as well. The project partners achieved substantial outcomes concerning the dissemination activities that were carried out. In each participating country, there is a continuous process of getting IFAC known and aware the target audiences by scheduled meetings, closed workshops, publications in partner's newsletters, publication of articles and presentations in national / EU-wide seminars.
Sources/references	http://cordis.europa.eu/search/index.cfm?fuseaction=proj.document&PJ_RCN=9464968

BALTIC STATES

47. Baltic States Network of Women in Science (BASNET)	
Country/region	Baltic States – Estonia, Latvia, Lithuania
Level of intervention	Regional, national
Who is driving it?	European Commission BASNET Forumas is an association registered in Lithuania. It is a legal non-profit organisation guided by Lithuanian laws.
Sector focus	SET
Target group	Policy and decisionmakers
Type of initiative	Strategic network
Description of initiative	<p>BASNET was established in 2006 as a European Commission FP6 project for the creation of a Baltic States strategy to increase the participation of women in Science and High Technology. In order to ensure a valid and efficient strategy, much attention in the project was paid to the sociological analysis of factors determining the under representation of women in the Sciences and High Technology in the Baltic States. The analysis of the problems women face in their careers in the sciences in European countries and in the USA, as well as recommendations made by sociological studies, led the study to conclude that the quickest way to improve the situation of women in science in the region is through the improvement of the existing science management policy. Based on this finding the specificities of national research and higher education systems, as well as policies targeted at measuring gender differences, and good practices in the field from other countries were analysed by national groups. As a result of these conclusions, the BASNET strategy for Women in Science and Higher Technology for the Baltic States region was created.</p> <p>Strategic objectives of the project are addressed:</p> <ul style="list-style-type: none"> - To establish the regional Baltic States Network among the corresponding international women working groups, professional organisations and corresponding departments of the governmental institutions. - To create common Baltic States strategy to increase women participation in sciences and HT and to ensure the equal participation of women in different fields of activity as well as in decision making process on different levels of science policy and its management. - To mobilize international efforts by establishing the interregional Baltic States Network “Women in Sciences and HT” among women working groups, professional organisations and corresponding departments of the governmental institutions. To monitor changes in the scientific society and dissemination of the information and good practices it is proposed: To establish the Baltic States Data Bases of Women in Sciences and HT; To create the monitoring and information systems on Women in Sciences and HT; To concentrate the interdisciplinary efforts on formulation of the common Baltic States science strategy to ensure the equal participation of women in Sciences and HT.
Activities	<p>Duration of the project is 24 months. It started on the 1st of January 2006 and will finish on the 31st of December 2007.</p> <p>Activities of the BASNET Forumas were:</p> <ul style="list-style-type: none"> - Monitoring and analysis of Baltic States science policies targeted to gender-sensitive and women-friendly system of S&HT - Mobilization of international efforts of social partners for implementation

	<p>BASNET strategy in the Baltic States region; Coordination of BASNET network</p> <ul style="list-style-type: none"> - Accumulation and dissemination of good practices in solving women in science problem - Updating and analysis of BASNET Data basis - Other activities to improve women in sciences situation in Sciences and high technology.
Outputs	Completed project, BASNET Forumas, Report, Networking, policy debates
Intended outcomes, effect	BASNET is designed to mobilize the interregional and interdisciplinary efforts for supporting development of the strategy to increase equal participation of women scientists in different fields of professional activity and in the decision-making process on different levels of science policy and its management in the Baltic States.
Evaluation	<p>The unique network of scientists and policy-makers meant institutional barriers could be overcome and allowed for a better framework within which the needs of women scientists could be met. For example, the BASNET strategy as adapted to all sciences (social and humanitarian) was accepted by the Lithuanian Ministry of Education and Sciences. Currently BASNET Forumas is involved as a partner into the starting now in Lithuanian National project LYMOS financed by EU structural funds and aiming to build the structural changes in Lithuanian science system towards implementation equal opportunities in sciences. The financial opportunities for implementation of the strategy at national level are currently being examined and attempts to improve the situation of women scientists, based on the findings of BASNET have been and continue to be discussed at governmental level in other Baltic States. In order to ensure the continuation of the main project tasks, it was decided to establish the Association BASNET Forumas. The mission of BASNET Forumas is to mobilize the efforts of members to support the implementation of BASNET Women in Sciences strategy in the BALTIC States region.</p>
Sources/references	<p>http://www.basnet-fp6.eu/news/brosh.pdf</p> <p>http://www.basnet-fp6.eu/about.php</p> <p>http://www.basnetforumas.eu</p>

ASIA

48. Asia Pacific Gender Equity in Science and Technology Programme (APGEST)	
Country/region	<p>Asia-Pacific</p> <p>The project was run in 12 countries – China, India, Nepal, Indonesia, Korea, Mongolia, Philippines, Vietnam, Fiji, Kiribati, Samoa and Thailand. At a national level, the programme was implemented with the support of National Focal Points who were appointed with the help of the Ministries of Science and Technology, local UNDP and UNESCO offices.</p>
Level of intervention	International - Grass-roots focus
Who is driving it?	<p>UNESCO</p> <p>Public</p>

Sector focus	Science and Technology
Target group	Women in local communities, access to science in order to produce income generation
Type of initiative	Educational programme Access to education that drives S&T learning
Description of initiative	Project objective: To promote the adoption of policies and programmes that ensure access to cutting edge science and technology by women living in poverty in the Asia Pacific region
Activities	<p>Project activities:</p> <p>The first phase of APGEST focused on reviewing policy and institutional reforms within the region and disseminating the results. The strategy behind this is to identify best practices in innovation that involve poor women in technology and enterprise; and to learn from this but also to connect networks, theory and practice. Five technology areas were focused on in phase one namely biotechnology, renewable energy, water, green health and information technology. Main activities for the first phase were:</p> <ul style="list-style-type: none"> - Assessment of resources, best learning practices and gaps in GEST - Technical assistance to two pilot projects in Thailand and Philippines - Dissemination of applications and results <p>The second phase of the programme would focus on (July 2003 and June 2006):</p> <ul style="list-style-type: none"> - The promotion of gender equity by advocating and lobbying activities - The empowerment of women and communities by utilizing S&T education and GEST - The promotion of women scientists to the highest level, though emphasizing gender responsive education and gender sensitive policies - To secure the continuing support of multilateral donors through the development of a well defined methodology and long-term strategy for science and education at the village level with the focus on the application of best learning practices
Outputs	Best practice policies & programmes, regional networks, methodologies and tools for utilization of science
Intended outcomes, effect	<p>Project outcomes to date:</p> <ul style="list-style-type: none"> - Best practices in the Asia Pacific region on policies, programmes, institution building and other related initiatives at promoting women's access to science and technology shall have been documented and disseminated - A functioning regional network of resource persons, institutions and networks shall be in place and is engaged in policy advocacy and technical cooperation - Methodologies and tools for the utilization of renewable energy, biotechnology, information technology, green health and water and sanitation for women's economic empowerment shall have been developed and disseminated - Promotion of policy recommendations and technical cooperation <p>Long term:</p> <ul style="list-style-type: none"> - Policy into practice - Linkage of modern and traditional knowledge and practice - Women at grassroots level utilizing their knowledge of S&T to generate income - More women involved in science at the highest level
Evaluation	N/A – various reports available

Sources/references	No active link – project no longer active
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49. Korean National Institute for Supporting Women in Science and Technology (ISWIST)	
Country/region	Korea
Level of intervention	National
Who is driving it?	Government
Sector focus	Science & Technology
Target group	Women in S&T
Type of initiative	Research in policy development; educating, training, and consulting with women in S&T; providing information on employment; and supporting organisations of women scientists and engineers.
Description of initiative	<p>The center is tasked with carrying out research in policy development; educating, training, and consulting with women in S&T; providing information on employment; and supporting organisations of women scientists and engineers. The Republic of Korea has one national institute in Seoul (NIS-WIST) and one each in Gwangju (GJIS-WIST), Busan (BIS-WIST), Daejeon (DCIS-WIST) and Daegu (DGIS-WIST) that provide nationwide coverage. NIS-WIST is responsible for the planning and steering of policy initiatives. About US\$2M in government funds is allocated to these action centers each year.</p> <p>ISWIST's mission is to foster women professionals in science and technology from the start of their employment to their becoming leaders in the S&T workplace. The most meaningful project is an annual investigation of the actual status of women in S&T. The report is the country's unique survey on gender recognition in S&T and provides a statistical database for policy development. The report is approved as a national statistic by Statistics Korea. Through this investigation, the matter of women employees in the R&D sector taking mainly temporary positions was first raised and is now well known to policymakers and the public.</p> <p>ISWIST is offering various training and supporting programmes to individuals. These include job training as a professional science communicator and lab manager, communication skills, S&T management, leadership training, and development of research ability. About 1,000 women science communicators have been trained and about 70 per cent of them work as afterschool science teachers, science writers, and screenwriters, producers, and actresses of science plays. About 200 women lab managers have been trained for supporting research laboratories mainly at universities. About 70 per cent of them work at university research laboratories nationwide. About 10,000 women scientists and engineers have participated in the training programmes since 2005.</p> <p>Non-governmental organisations (NGO) of women scientists and engineers have received financial support for national or international activities in their social and academic networking. The Association of Korean Women Scientists & Engineers (KWSE), which is the first NGO for women scientists and engineers in the</p>

	<p>Republic of Korea, organized a successful international conference initiated to launch INWES-ASIA. INWES stands for International Network of Women Engineers and Scientists. A KWSE member will serve as the next president of INWES.</p> <p>The WIST-FIT (Women in S&T - Friendly Institutional Transformation) project, benchmarked from the ADVANCE programme of the United States of America's National Science Foundation, was launched in 2004 to support S&T organisations willing to promote women employees and develop a work environment conducive to family life. Six national and four private universities and 14 public R&D institutes have participated in this project. Kyungpook National University has seen the most outstanding result under this programme and has been named the Best Gender Equality University by the Ministry of Education, Science and Technology.</p>
Activities	<ul style="list-style-type: none"> - The center is tasked with carrying out research in policy development; educating, training, and consulting with women in S&T; providing information on employment; and supporting organisations of women scientists and engineers - Annual investigation of the actual status of women in S&T. The report is the country's unique survey on gender recognition in S&T and provides a statistical database for policy development - ISWIST is offering various training and supporting programmes to individuals - Non-governmental organisations (NGO) of women scientists and engineers have received financial support for national or international activities in their social and academic networking - The WIST-FIT (Women in S&T - Friendly Institutional Transformation) project, benchmarked from the ADVANCE programme of the United States of America's National Science Foundation, was launched in 2004 to support S&T organisations willing to promote women employees and develop a work environment conducive to family life. Six national and four private universities and 14 public R&D institutes have participated in this project.
Outputs	Research in policy development; educating, training, and consulting with women in S&T; providing information on employment; supporting organisations of women scientists and engineers, survey on gender recognition in S&T (statistical database for policy development), financial support.
Intended outcomes, effect	Policy development; educating, training, and consulting with women in S&T; providing information on employment; and supporting organisations of women scientists and engineers
Evaluation	Available online
Sources/references	http://www.un.org/womenwatch/daw/egm/gst_2010/Lee-EP.6-EGM-ST.pdf

MALAYSIA

50. Technology Acquisition Fund for Women (TAF-W)	
Country/region	Malaysia
Level of intervention	National
Who is driving it?	Industry and public service: Technology Development Corporation; Ministry of Science, Technology and the Environment, Government of Malaysia
Sector focus	Technology
Target group	Women entrepreneurs in Malaysia

Type of initiative	Government programme Award programme – financing for women entrepreneurs
Description of initiative	<p>The Award aims to enable greater access to financing for women entrepreneurs</p> <p>Technology Development Corporation was formed by the Government in 1992 to spearhead Malaysia's technology development. MTDC started off as a venture capital company providing financing to technology-based projects. One of its major activities is to become the national body to commercialise technology developed by local R&D institutions. The Technology Acquisition Fund for Women (TAF-W) will allow greater access to financing for women entrepreneurs. TAF-W provides partial grant to further promote efforts by women entrepreneurs to enhance their technology level and production processes. The objectives of TAF-W are:</p> <ul style="list-style-type: none"> - To integrate more women-owned companies into the main stream of manufacturing - To upgrade the technological capabilities, technical skills and expertise of women-owned companies; and - To enhance the competitiveness levels of women-owned companies <p>Eligibility Criteria include:</p> <ul style="list-style-type: none"> - Company incorporated under the Companies Act 1965 - Company involved in the manufacturing activities and manufacturing related services - At least 60% of the equity must be held by Malaysians, of which not more than 25% held by large companies - Public listed companies or their subsidiaries are not eligible to apply - For a 60% Malaysian owned company - A minimum of 51% of the local equity must be held by woman/women and the company is run and managed by a woman; or - The MD/CEO must be a woman and she must hold a minimum equity of 10% in the company - For a 100% owned Malaysian company - A minimum of 51% of the equity must be held by a woman/women; or - In the case where the majority equity is not held by a woman/women - The largest single shareholder must be a woman and the company is run and managed by a woman; or - The MD/CEO is a woman and has a minimum equity of 10% in the company
Activities	<p><i>Technology Licensing:</i> To enhance the design and production of new and existing products and processes. The technology to be acquired should include design, blueprints, manufacturing know-how, training, technical support and proprietary equipment.</p> <p><i>Acquisition of patent rights, prototypes and design:</i> To facilitate transfer of technology to enable the development of new processes and products. All acquisition must include manufacturing rights from technology provider for manufacturing purposes.</p> <p><i>Purchase of high tech equipment and machinery:</i> The objective of technology acquisition through purchase of high tech equipment and machinery is to enhance the current production processes and the physical development of new products.</p>

	<p><i>Placement of Malaysians in technology companies or technology institutes:</i> To expose Malaysians and upgrade their knowledge on technology development in foreign technology companies or institutes excluding affiliated or subsidiary companies overseas.</p> <p><i>Foreign expert sourcing program:</i> To assist companies to engage foreign technical experts and consultants in upgrading their products and processes.</p> <p><i>Business relocation:</i> For relocation of business operations to Technology Parks, Incubation Centres or the Multimedia Super Corridor.</p>
Outputs	<ul style="list-style-type: none"> - Financing opportunities – grants - Technology licensing - Purchasing of high tech equipment and machinery - Sourcing of foreign technical experts and consultants to assist in the upgrading of products and processes
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased financing for women entrepreneurs - More women-owned companies in the main stream of manufacturing - Upgraded technological capabilities, technical skills and expertise of women-owned companies - Enhanced competitiveness levels of women-owned companies
Evaluation	N/A
Sources/references	<p>www.mtdc.com.my#sedica Technology Acquisition Fund for Women - Malaysia.doc# 1,6027,6055,0,,</p> <p>Web site: www.mtdc.com.my</p>

JAPAN

51. Society for Japanese Women Scientists	
Country/region	Japan
Level of intervention	National
Who is driving it?	Academia
Sector focus	SET general
Target group	Women scientists in Japan
Type of initiative	Non-profit organisation/Society
	Support and networking for women scientists
Description of initiative	<p>The Society was established in 1958 and was formed to encourage mutual support and friendship amongst Japanese women scientists, a group, which was small and weak at that time. A factor which prompted the foundation of the Society was the encouragement, given by the Committee of Seven to Appeal for World Peace, which consisted of seven famous Japanese scientists including Professor H. Yukawa, a Nobel Laureate in 1949, to send delegates of Japanese women scientists to the 4th World Women's Conference held in Vienna in 1958. In 1964, the International Conference of Women Scientists and Engineers (ICWES) was organized in New York City, and since its first conference, the Society has represented Japan. The Society aims to facilitate the exchange of knowledge in various fields of academic research.</p>

Activities	The Society holds regular meetings, public lectures, and symposia every year. It publishes a Japanese newsletter twice a year. Networking, information sharing
Outputs	The Society holds regular meetings, public lectures, and symposia every year. It publishes a Japanese newsletter twice a year.
Intended outcomes, effect	Mutual support and friendship amongst Japanese women scientists Exchange of knowledge in various fields of academic research
Evaluation	N/A
Sources/references	http://leo.aichi-u.ac.jp/~kunugi/sjws/e1.htm

INDIA

52. The Women Scientists Scheme (WOS)	
Country/region	India
Level of intervention	National
Who is driving it?	Public service: Department of Science and Technology, Government of India
Sector focus	Societal development, basic and applied sciences
Target group	Women in S&T in India: entry, current and especially returners
Type of initiative	Government programme – funding/scholarship programme Participation, reentry , career development in pure and applied sciences
Description of initiative	<p>WOS provides opportunities to women scientists and technologists between the age group of 30-50 years who desire to return to mainstream science and work as bench-level scientists. Through this endeavour of the Department, a concerted effort would be made to give women a strong foothold into the scientific profession, help them re-enter into the mainstream and provide a launch pad for further forays into the field of science and technology, both from the point of view of pure science and its application to societal development. Under this scheme, women scientists are being encouraged to pursue research in frontier areas of science and engineering, on problems of societal relevance and to take up S&T-based internship followed by self-employment.</p> <p>The various categories of Scholarship available are indicated below:</p> <p><i>Scholarship for research in basic/applied science (WOS-A):</i> This category of scholarships is meant to encourage women scientists to pursue R&D in emerging and frontier areas of Science and Engineering. The women scientists will be provided flexibility to undertake research at a suitable institution depending on their area of interest. These scholarships are expected to provide opportunities to women scientists to get into scientific profession so that they are able to contribute to Science and Technology development. The overall concept is to ensure that large numbers of women scientists enter scientific activity in the country. DST has vast experience in promoting basic research in frontier areas of Science and Engineering and this new initiative will go a long way in bringing a large number of women scientists towards contributing to basic research.</p> <p><i>Scholarship for research in S&T (WOS-B):</i> This scholarship is specially intended to encourage women scientists involved in research and application of innovative</p>

	<p>solutions for various societal issues. This scholarship would be made available to the aspiring women scientists willing to work for the search, design, adaptation and demonstration of Science and Technological skills and techniques for improving the income generating activity and reducing drudgery of weaker sections of our society in different occupations, capacity building on the societal programs at the grassroots level etc.</p> <p><i>Internship for self-employment (WOS-C):</i> This category is mainly focused to provide an opportunity to women scientists for self-employment by utilizing their specialized domain knowledge in areas such as patenting, proof reading, science journalism, technical translation, clinical pathology labs, medical transcription etc. The objective of this scholarship is to create a large pool of trained women workforce with experience in the diverse areas mentioned above and building up a professional network.</p>
Activities	Funding scholarships
Outputs	Scholarships and funding
Intended outcomes, effect	<ul style="list-style-type: none"> - Women returning to mainstream science - Women pursuing research in frontier areas of science and engineering - Women pursuing research on problems of societal relevance - Women becoming self-employed by utilizing their specialized domain knowledge - Increase in the pool of trained women workforce with experience in diverse areas – thereby building up a professional network
Evaluation	N/A
Sources/references	http://dst.gov.in/scientific-programme/women-scientists.htm

53. Technology Parks for Women	
Country/region	India
Level of intervention	National – application
Who is driving it?	Government of India
Sector focus	Technology
Target group	Ordinary women in India
Type of initiative	<p>Government programme/Technology park</p> <p>Training and access in field of technology</p>
Description of initiative	<p>The technology parks are designed to give ordinary women in India access to and training in various appropriate technologies. The Indian government has established three technology parks for women. The parks will provide facilities for training programmes for various trades which are location-specific. These activities will be replicated in other parts of the country in due course. The main task is to develop appropriate and relevant technologies, demonstrated through the Technology Park mechanism and facilitate their adaptation and transfer leading to replication by other agencies.</p> <p>The primary aim of this scheme is to help thousands of under-privileged women to achieve a better quality of life by creating awareness amongst women of the availability and utility of new technologies, instruments and appliances which are women-friendly in their day-to-day work. Besides giving them exposure for effective utilisation of natural resources like land, water and vegetation they also specify effective use for their day-to-day requirements. They provide technological solutions to problems faced by women by networking NGOs and research</p>

	institutions in the area and providing opportunities to women for better utilisation of by products and wastes for value addition. They further provide scope for skill upgradation towards higher productivity and economic gains and also establish linkages with the Panchayati Raj Institutions for effective implementation and monitoring of the initiatives taken by the Department of Science and Technology.
Activities	Training, technology promotion and transfer
Outputs	Well functioning technology parks that can be duplicated
Intended outcomes, effect	<ul style="list-style-type: none"> - Women in India having access to and training in various appropriate technologies - Increased awareness amongst women of the availability and utility of S&T which are women-friendly in their day-to day work
Evaluation	N/A
Sources/references	http://pib.nic.in/feature/fe0399/f1003991.html

54. Conference of Women Scientists and Technologists: Role in National Development	
Country/region	India
Level of intervention	National
Who is driving it?	Government of India
Sector focus	SET general
Target group	Women in SET in India: researchers, scholars and young scientists
Type of initiative	Conference: Networking, awareness, application of S&T for benefit of rural women
Description of initiative	<p>The Conference provided a forum for women researchers, scholars and young scientists to interact with eminent women scientists and policy makers. This was the first ever two-day conference of Women Scientists and Technologists on "Role in National Development" and was opened to mark International Women's Day. This Conference was held 8-9 March 2002 at Vigyan Bhawan New Delhi. It was organised by the Department of Biotechnology (Ministry of Science and Technology) and the Department of Women and Child Development (Ministry of Human Resource Development). The Conference provided a forum for women researchers, scholars and young scientists to interact with eminent women scientists and policy makers. Recommendations from this conference were aimed at kindling the interest of women in S&T careers and to apply science and technology for the benefit of rural womenfolk in India.</p>
Activities	<p>An interactive open house discussion was held in which the delegates participated actively. The discussions were organized in three main categories: Women in S&T; S&T for women and Institutional Framework The main conference themes were:</p> <ul style="list-style-type: none"> - Achievements of women scientists and technologists - Career options for women in science and engineering - Business opportunities for women scientists and engineers - Reaching the Unreached - Agriculture, Biology, Biotechnology and Medicine - Nuclear Sciences, Space, Engineering, Physical and Earth Science
Outputs	Networking opportunity, information sharing, conference reports

<p>Intended outcomes, effect</p>	<p>The main recommendations under each of the above categories are as follows :</p> <p>Women in S&T</p> <p><i>Jobs, Scholarships and Training:</i></p> <ul style="list-style-type: none"> - Present training programme to continue for career options - Reaching the unreached programme – For higher studies at college and university level, statewise scholarships, for rural girl students - Five years contractual service (at any level) with bona fide faculty/scientist status so that the entrant can write grants and conduct independent research along with hiring students and obtaining lab space from the host and participating in the host institute program. This should be taken through a proper selection procedure. There may be a provision to renew the contract after 5 years. - Increase the number of scholarships –present number is disproportionate to the number of candidates - There should be age relaxation, part time job options, flexi-timing and options for re-entry. <p><i>Entrepreneurship promotion for women scientists:</i></p> <ul style="list-style-type: none"> - To grant R&D status to small scale entrepreneurs so that they are not burdened by loans alone and can apply for peer reviewed grants from the ministry - Creation of an infrastructure for market research/survey, which can link market options to the women entrepreneurs - To establish nodal agencies in different geographical locations, for industry promoting bodies such as BCIL, so that their training and placement programs can be used countrywide - Database of unemployed but skilled women scientists who are looking for jobs - Database for accumulating the problems of the rural/unreached through NGOs etc, so that solutions can be worked out at the lab levels - Women scientists at premier laboratories/ retired personnel should come forward for networking of resources, information for promotion of younger women scientists, societal welfare and guidance programme for students. <p>S&T for Women</p> <ul style="list-style-type: none"> - Value addition of local specific knowledge and recognition of the innovations and developments that take place at grass root level - Convergence between the departments/ agencies and pooling the resources of Govt. / NGOs and others - Access to appropriate technologies and participation in technology development and dissemination through rural technology centres/ entrepreneurial promotions parks/ women development centres - Incentives for societal programmes with proper recognition and reward system - Easy access to credit and marketing facilities. <p>Institutional Frame Work</p> <ul style="list-style-type: none"> - Setting up of an Inter Agency Action Council for Reaching the Unreached for Women – this can be with the participation of all concerned ministries and departments of the Centre - More Institutional Networking of Women in S&T at State, Centre and Academic level. - Setting up of Women Empowerment Network Centres specially in States Awareness regarding S&T for women through training, counseling
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	<p>programmes for teachers and trainers to ensure wider dissemination of information to be done by state S&T councils</p> <ul style="list-style-type: none"> - An earmarked scheme on S&T for women may be included under the budget head of State S&T Councils.
Evaluation	See recommendations from conference
Sources/references	http://dbtindia.nic.in/women/postconference.htm

FINLAND

55. WomenIT	
Country/region	Finland
Level of intervention	National and pan-European – policy and application
Who is driving it?	Academia (Kajaani University Consortium of the University of Oulu) Funded by the European Social Fund's EQUAL initiative
Sector focus	Technology and Industry
Target group	Girls and women
Type of initiative	Access through training, research and development
Description of initiative	<p>WomenIT sought to reduce the segregation of the labour market by gender by influencing the structures and operating models that maintain job segregation by gender and that result in inequality in other areas of society as well. Main focus of WomenIT was on supporting girls and women to pursue careers in technology and industry.</p> <p>The activities focused on inspiring girls and women to work in technology.</p>
Activities	<p>Implemented in day-care centres, schools, institutions of upper secondary level education, polytechnics, universities, enterprises and labour organisations.</p> <p>Consisted of three sub-projects:</p> <ul style="list-style-type: none"> - Sub-project 1 involved the administration of development partnerships and the coordination of activities that supported or were targeted at the entire development partnership. - Sub project 2 and 3 were formed around the partners' sub-projects so that sub project 2 comprised projects involving working life while sub-project 3 focused on the educational and pedagogical sector. <p>Other methods included working groups, an online environment, training and international activities. Also included gender sensitive career-guidance.</p>
Outputs	New courses, education content and models, teaching materials and practices.
Intended outcomes, effect	The key concept in implementing the project was the awareness of real change requiring more than just introducing girls and women to technology and attracting them to the field. In order to achieve more lasting change; it is necessary to influence structures and policies in the segregated labour market. This means both acknowledging the factors causing gender inequality and identifying unequal operating models and structures.
Evaluation	<p>Achieved remarkable results:</p> <ul style="list-style-type: none"> - The actors involved now better identify differences between the genders and take them into account in teaching and education; good practices

	<p>have become an integral element of the everyday work in schools and day-care centres.</p> <ul style="list-style-type: none"> - The girls and women participating in various project activities improved their technological skills, gaining courage, initiative and enthusiasm for technology. - They are also more aware of their skills and the potential career choices open to them.
Sources/references	Haataja et al (2006)

56. Women of Learning	
Country/region	Finland
Level of intervention	National
Who is driving it?	Academia
Sector focus	Women academia
Target group	General public
Type of initiative	Awareness raising, profiling
Description of initiative	Women in Finland, as elsewhere in the world, have for a long time been involved in academic research. However, very often their work has been shadowed by the achievements of their male colleagues. This online exhibition is dedicated to the past and present generations of women academics in Finland. These pages feature the pioneering individuals who opened up academic careers for women, and bring to light the achievements of women who worked behind the scenes as research assistants, laboratory and field workers and as research associates to their husbands.
Activities	These pages contain personal biographies of female scholars as well as general information on the status of women in the Finnish academic world. The pages are organised chronologically and according to academic fields, without forgetting an index of names. This online exhibition was constructed in connection with the exhibition Women of Learning, mounted in cooperation between the Helsinki University Library and the Christina Institute of Women's Studies in 2000. This site will be permanently available and updated on a regular basis.
Outputs	Website profiles
Intended outcomes, effect	Increased awareness of the significant contribution women in academia are making in Finland
Evaluation	N/A
Sources/references	http://www.helsinki.fi/akka-info/tiedenaiset/english/index.html

NORWAY

57. Committee for Gender Balance in Research (KIF Committee)	
Country/region	Norway
Level of intervention	National and institutional level
Who is driving it?	Government and academia
Sector focus	Higher Education, Science
Target group	Policy and decisionmakers, employers, Advocates
Type of initiative	Coordinating body, national strategy

Description of initiative	Launched in 2004, the KIF committee has now completed two terms. The third committee has been appointed to serve from 1 April 2010 to 31 December 2013, and has changed its name from the <i>Committee for Mainstreaming – Women in Science</i> to the <i>Committee for Gender Balance in Research</i> . The Committee will support and provide recommendations on measures that can contribute to the mainstreaming of the gender equality efforts at the institutions within the university and college sector as well as the research institute sector. The Committee may also contribute to an overall awareness rising around issues connected to the skewed gender balance in academia and the research sector. Actors and institutions in the university and college sector and in the research institutes sector, departments and the Research Council of Norway will be able to apply for advice from the Committee.
Activities	Gender mainstreaming resources (gender action plans, legislative tools) consulting, advocacy and lobbying, awareness-raising
Outputs	The website <i>Gender Balance in Research - Norway</i> is a resource for those who work for an improved gender balance in the research sector, and those who are interested in issues on gender equality in science. Gathered here are useful links, relevant literature and statistics on women and gender equality in science. We have also put together a catalogue of different measures to improve the gender balance, with examples of measures that have proved to be especially successful. Some of these are discussed in depth, as inspiration for those who work for gender equality in Norwegian research institutions.
Intended outcomes, effect	The Committee's mandate is to support and give recommendations on measures that contribute to mainstreaming of gender equality work in the institutions in the university and college sector and in the research institute sector, and thus promote gender equality.
Evaluation	N/A
Sources/references	http://eng.kifinfo.no/index.html

57a .Gender Equality Award	
Country/region	Norway
Level of intervention	National and institutional
Who is driving it?	Ministry of Education and Research
Sector focus	Research general
Target group	HE & Public research institutions – policy and decisionmakers
Type of initiative	Award scheme
Description of initiative	Purpose: The Gender Equality Act states that the employer is responsible for set down goals and plans to achieve gender equality for all employees. The Ministry of Education and Research requires universities and university colleges to establish an action plan for gender equality along with the appropriate measures. On this basis the Ministry sets the goals for the gender equality work through the letters of allocation that go out to the institutions. The establishment of the Gender Equality Award is a concrete and visible ministerial measure to encourage institutions within higher education and research, and to give the gender equality work an

	<p>extra boost. The award aims to increase the proportion of women in academic positions and thereby promote a better gender balance in academia, and is an addition to the resources that the institutions themselves have reserved for gender equality work.</p> <p>The Ministry of Education and Research in Norway has established a yearly Gender Equality Award of two million Norwegian kroner (about 224 300 euro) to reward the research communities' gender equality efforts. The award was established in 2007 and has been given out four times, in 2007, 2008, 2009 and 2010. The prize money is intended to serve as a supplement to the resources that the institutions themselves set aside for their gender equality activities. The award goes to the institution(s) or research institute(s) with the best measures for improving the gender balance in the university, university college and research institute sector in Norway. The Committee for Gender Balance in Research (KIF) is responsible for announcing the award, evaluating the nominees and making a recommendation to the ministry.</p>
Activities	<p>The Ministry of Education and Research has settled on the following criteria and guidelines:</p> <ul style="list-style-type: none"> - The award will go to institutions that have worked to promote women in science by implementing action plans for gender equality - The institutions can submit both their general action plans and plans implemented by one of their subdivisions - The award shall support an institution's action plans and must be used for specific gender equality measures - It will be taken into consideration whether the institution can show that it has implemented specific measures and carried out its action plan - The award is a supplement to the resources the institution itself will spend on its action plan and gender equality measures - The application must state how much the institution has earmarked for these purposes - The submitted action plans must be approved and made public in order to compete for the award. If the institution has established measures not listed in the action plan, these can also be included. Action plans in the making (not completed) that are not approved by the institution, that are expired or too old will not be considered for the award - The Kif Committee will consider whether the award will go to one or more recipients after assessing the range and quality of the applications - Universities, university colleges and institutes may apply
Outputs	Award and funding
Intended outcomes, effect	The award aims to increase the proportion of women in academic positions and thereby promote a better gender balance in academia, and is an addition to the resources that the institutions themselves have reserved for gender equality work
Evaluation	N/A
Sources/references	http://eng.kifinfo.no/c62449/seksjon.html?tid=62487

58. Gender equity at Norwegian University of Science and Technology

Country/region	Norway
Level of intervention	Institutional
Who is driving it?	Academia

Sector focus	HE
Target group	Women working in HE and those wanting to progress
Type of initiative	Support, networking, mentoring
Description of initiative	NTNU is committed to encouraging and promoting qualified women in academic and administrative positions. The most comprehensive of these are start packages for women in permanent scientific positions in male-dominated departments, stipends to aid women in associate professor positions to become full professors; and NTNU mentoring programmes for women who are in recruited and associate professor positions. NTNU also has an action plan to promote gender equality, as well as an action plan to address sexual harassment.
Activities	<p><i>Support for women in permanent academic positions:</i> NTNU wants to ensure that all women achieve their highest potential no matter their academic position, but recognizes that departments or programmes where men dominate can be particularly challenging. The university offers a "start package" to support women in these situations. Women who want to take advantage of NTNU's "starter kit" need to be in a department where the proportion of women among permanent academic staff is less than 20%. Women in this situation can apply for operating and equipment funds, as well as salaries for research assistance. Applicants should list their needs in order of priority and with the associated costs, and should also supply supporting arguments for their request. In the evaluation of applications, the applicant's research will be prioritized, as well as the manner in which the application will help to realize the Institute's research strategy, including strategies to recruit and retain women in scientific positions. If a faculty applies for "starter kits" for more than one individual, the applications should be ranked in order of priority. The university may request a report after a specified period of time on how well the initiative has worked.</p> <p><i>Mentor programme:</i> In June 2010, NTNU's eighth mentor programme was completed and evaluated. The programme is a permanent element in NTNU's strategy for gender equality and organisational development. In a mentor programme, an experienced person of great integrity with substantial influence in their environment (the mentor) takes on the role of a guide and partner in dialogue for a person who wishes to develop their career (the mentee). It is a programme for mutual learning and exchange of experience, networking, and mobilizing expertise. Mentors are professors, both men and women. Mentees are women in PhD candidate, postdoc and associate professor positions. At the heart of the programme is the constructive dialogue between the mentor and mentee. Objectives of the mentoring programme include strategic career development for women; establishment of the basis for networking, and to create a two-way exchange of knowledge and experience. The programme runs for the duration of one academic year during which period the mentor and mentee undertake to meet once a month for a discussion lasting a couple of hours. Networking meetings on a variety of topics are organized once a month for the mentees. In addition, group sessions for all the participants are held at the beginning and end of the</p>

	programme. The mentee and mentor come from completely different departments. The programme includes 15 pairs.
Outputs	Financial support, mentoring, workshops, networking opportunities
Intended outcomes, effect	Women in HE feeling supported and progressing – especially to professorships
Evaluation	Various
Sources/references	http://www.ntnu.edu/studies/gender_equality

US

59. Society of Women Engineers (SWE)	
Country/region	US
Level of intervention	National
Who is driving it?	Academia and industry
Sector focus	Engineering
Target group	Women in engineering: Students and professional women in engineering and technical fields
Type of initiative	Non-profit organisation/Society Awareness, support, career advancement, reentry
Description of initiative	<p>The Society works to promote and support women in engineering, and to advance the profession as a whole. The SWE is the largest non-profit educational and service organisation representing both student and professional women in engineering and technical fields. The SWE was founded in 1950 and has its headquarters in Chicago, Illinois in the United States. It has over 17,000 members in 90 sections and 300 student sections and more than 400 members-at-large.</p> <p>Its mission is to:</p> <ul style="list-style-type: none"> - Stimulate women to achieve full potential in careers as engineers and leaders - Expand the image of the engineering profession as a positive force in improving the quality of life - Demonstrate the value of diversity. <p>The objectives of the SWE are to:</p> <ul style="list-style-type: none"> - Inform young women, their parents, counselors, and the general public, of the qualifications and achievements of women engineers and the opportunities open to them - Assist women in readying themselves for a return to active work after temporary retirement - Serve as a center of information on women in engineering - Encourage women engineers to attain high levels of education and professional achievement. <p>The strategic priorities of the SWE include:</p> <ul style="list-style-type: none"> - Education and Outreach: The technical professions will benefit, and the quality of life will be enhanced by more women of all backgrounds pursuing the profession of engineering - Inclusive Organisation: SWE will be an inclusive organisation focused on issues of interest to women of all backgrounds in engineering and technical careers - Knowledge Source: SWE will be a worldwide leader and preferred partner in the creation and advancement of information about women in technical careers - Professional Leadership: Women will be acknowledged as demonstrating the skills required to be effective leaders in a global marketplace - Value and Benefit: SWE programs and services across the organisation will provide value and benefit and meet the diverse and changing needs of Society members and stakeholders.
Activities	Education, outreach, information-sharing, professional development
Outputs	SWE, Magazine of the Society of Women Engineers (ISSN 1070-6232), is published in five issues plus a leadership supplement. Articles in SWE cover issues of interest to women engineers including the achievements and

	accomplishments of women engineers, career development, career guidance for and outreach to students, activities within the Society, and technical themes geared to an audience covering a broad range of engineering disciplines.
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased awareness of the qualifications, achievements and opportunities for female engineers - Returners equipped for reentry - Women engineers more encouraged to attain high levels of education and professional achievement
Evaluation	N/A
Sources/references	http://www.societyofwomenengineers.org/

60. Presidential Awards for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM)	
Country/region	USA
Level of intervention	National
Who is driving it?	Public service: The White House established the programme in 1996. Administered by the National Science Foundation on behalf of the White House.
Sector focus	Science, mathematics and engineering
Target group	Mentees in Science, mathematics and engineering
Type of initiative	Award scheme: Awareness, reward, increased participation
Description of initiative	Seeks to identify outstanding mentoring efforts or programs designed in science, mathematics and engineering. The awardees serve as exemplars to their colleagues and are leaders in the national effort to more fully develop the nation's human resources in science, mathematics and engineering.
Activities	Awards
Outputs	Examples of outstanding mentoring efforts or programmes design in science, mathematics and engineering.
Intended outcomes, effect	Examples will encourage others to more fully develop human resources in science, mathematics and engineering
Evaluation	N/A
Sources/references	http://www.research.uky.edu/membrane/Paesmem/index.html

61. ADVANCE Institutional Transformation Programme	
Country/region	USA
Level of intervention	National
Who is driving it?	Public sector: NSF and academia
Sector focus	Academic science and engineering
Target group	Persons/institutions that use approaches that can increase the representation and advancement of women in academic science and engineering careers
Type of initiative	<p>Funding</p> <p>Approaches to increase the representation and advancement of women in academic science and engineering careers</p>
Description of initiative	The goal of the ADVANCE programme is to develop systemic approaches to increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse

	<p>science and engineering workforce. Creative strategies to realize this goal are sought from women and men. Members of underrepresented minority groups and individuals with disabilities are especially encouraged to apply.</p>
Activities	<p>Types of ADVANCE Projects:</p> <p><i>Partnerships for Adaptation, Implementation, and Dissemination (PAID) Awards:</i> Partnerships for Adaptation, Implementation, and Dissemination awards support analysis, adaptation, dissemination and use of existing innovative materials and practices that have been demonstrated to be effective in increasing representation and participation of women in academic science and engineering careers. This category of award also supports proposals for developing national and/or discipline-specific leadership in enabling the full participation and advancement of women in academic science and engineering careers.</p> <p><i>Institutional Transformation (IT) Awards:</i> Institutional Transformation Awards support academic institutional transformation to promote the increased participation and advancement of women scientists and engineers in academe. These awards support innovative and comprehensive programs for institution-wide change.</p> <p><i>Institutional Transformation Planning Grants (IT-Start):</i> IT-Start awards support basic data collection and analysis functions necessary to understand the status of women faculty in academic science and engineering at institutions seeking institutional transformation. This category of award is intended to broaden the spectrum of institutions participating in ADVANCE activities. IT-Start awards seek to include institutions with varying institutional scope, sizes, experiences, and perspectives, for example (but not limited to): primarily undergraduate institutions, teaching intensive colleges, community colleges, minority-serving institutions (e.g. tribal colleges, Historically Black Colleges and Universities, Hispanic serving institutions) as well as women's colleges.</p>
Outputs	<p>The following institutions have their own Advance programmes running under the Institutional Transformation Awardee banner: University of Alabama at Birmingham, University of Arizona, Brown University, California State Polytechnic University, University of California (Irvine), Case Western Reserve University, University of Colorado (Boulder), Columbia University's Earth Institute Cornell University Georgia Institute of Technology University of Illinois (Chicago, Iowa State University, Kansas State University, University, University), University of Michigan, Ann Arbor, University of Montana, New Mexico State University Hunter College (City University of New York), University of North Carolina at Charlotte, University of Puerto Rico, Humacao, Rensselaer Polytechnic Institute, University of Rhode Island, Rice University, University of Texas at El Paso, University of Washington University of Wisconsin (Madison), Utah State University, Virginia Polytechnic Institute and State University</p>

Intended outcomes, effect	<ul style="list-style-type: none"> - Acknowledgement of and increase in national and/or discipline-specific leadership in enabling the full participation and advancement of women in academic science and engineering careers - Acknowledgement of and increase in academic institutional transformation to promote the increased participation and advancement of women scientists and engineers in academe - Systems that increase the understanding of the status of women faculty in academic science and engineering at institutions seeking institutional transformation.
Evaluation	N/A
Sources/references	http://www.nsf.gov/crssprgm/advance/index.jsp

62. MentorNet	
Country/region	USA
Level of intervention	National, and also strong grass-root approach
Who is driving it?	Academia, industry and public service
Sector focus	Engineering and related sciences
Target group	Women in engineering and related sciences: Undergraduate, Master of Science, doctoral and post-doctoral women students in engineering and related sciences and professionals in industry and government agencies with a degree in these disciplines
Type of initiative	Electronic mentoring programme aimed at increasing women's retention in engineering and related sciences
Description of initiative	Was founded in 1997 to utilize ICT for building an electronic mentoring programme and to use electronic mentoring for increasing women's retention in engineering and related sciences. It offers electronic mentoring opportunities for undergraduate, Master of Science, doctoral and post-doctoral women students in engineering and related sciences and professionals in industry and government agencies with a degree in these disciplines. Best known programme is the One-on-One E-mentoring Program.
Activities	The programme matches participants in year-long mentoring relationships that are conducted via e-mail. MentorNet has developed a structured approach to electronic mentoring providing online training, coaching and ongoing support for mentors and participants throughout their mentoring relationship. Eligible prospective protégés and mentors complete and online application, providing detailed information about their intended majors or professional disciplines, career interests or sectors of employment and demographic information in addition to preference for being matched by gender, Alma Mater, particular topics of interest or concern and other variables. The application data are stored in a linked SQL database. MentorNet developed its own bi-directional matching programme that sorts through the application data identifying optimal pairings of mentors and students with the goal of maximizing the number of good matches and as many matches as possible. The application form allows mentors and students to respond to open-ended questions. After the electronic matching is completed; MentorNet staff check the matches, comparing the matching results with the individual's responses, which in some cases led to a rematch of mentor and

	<p>student with another participant. MentorNet also includes online training material on its web site, such as mentor's and student's guide, recommendations on how to communicate effectively online and web-based interactive e-mentoring case studies. After the match has been approved, the matched pair receives an e-mail with the mentor and protégé's information.</p> <p>Also consists of a coaching curriculum that consists of e-mail messages sent to each participant approximately every 2 weeks for the duration of their mentoring relationship. They are different for mentor and protégé populations and tailored to the protégé's educational level. The messages contain discussion suggestions for academic issues (e.g. what course to take), job-related issues (e.g. how to write resume, finding an internship, how to network effectively) and socio-cultural issues (studying/working in a male-dominated environment, balancing work with raising a family). The regular e-mail contact between programme staff and participants functions as a reminder for protégé and mentor to stay in touch, guides the e-mentoring pairs through the different phases of the mentoring relationship, and gives mentors and protégés who need assistance with trouble-shooting or individualized support the opportunity to contact staff. The e-mentoring comes to a formal end by asking the mentors and protégés to negotiate an agreement about whether to continue the relationship in some form and to complete an online evaluation.</p>
Outputs	<ul style="list-style-type: none"> - Mentors and mentees matched in year-long electronic mentoring relationships that are conducted via e-mail - Online training material - Coaching curriculum that consists of e-mail messages sent to each participant approximately every 2 weeks for the duration of their mentoring relationship.
Intended outcomes, effect	Increase in women's retention in engineering and related sciences.
Evaluation	Online statistics provided – monitored and updated regularly.
Sources/references	http://www.mentornet.net/

63. Women in Science Programme(WISP)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia and public service: Office for Women's Affairs, Indiana University-Bloomington, United States
Sector focus	Science and mathematics
Target group	Women in science and mathematics at undergraduate, graduate and faculty levels at the Indiana University
Type of initiative	University programme: Participation in science and mathematics fields in HE: undergraduate, graduate and faculty level
Description of initiative	WISP seeks to develop and implement programs that promote the participation of women in science and mathematics fields at the undergraduate, graduate, and faculty levels. The project's long-range goal is to create a positive learning and working environment in which women in science and mathematics can thrive and

	<p>succeed. The goals of WISP include:</p> <ul style="list-style-type: none"> - To improve the learning and working environment for women in science and mathematics fields - To increase the representation of women in science and mathematics fields at the undergraduate, graduate and faculty level - To establish policies and programs that will attract and encourage talented women to pursue careers in mathematics and science disciplines.
Activities	<p>WISP sponsors the visits of distinguished women scientists, instructional development grants, mentoring and student support groups, and a student research day. WISP has a range of programmes. These include:</p> <ul style="list-style-type: none"> - WISP Research Day Poster winners - WISP Science Research Undergraduate Fellowship (SURF) Programme - WISP Mentoring ProgrammeInformation and meetings - WISP Tutoring Programme - WISP Grant-writing Success <p>The WISP web site also provides information on a range of other grants and fellowships available. WISP also publishes the WISP Wire Newsletter.</p>
Outputs	<ul style="list-style-type: none"> - WISP Research Day Poster winners - WISP Science Research Undergraduate Fellowship (SURF) Programme - WISP Mentoring ProgrammeInformation and meetings - WISP Tutoring Programme - WISP Grant-writing Success - WISP Wire Newsletter - SURF Fellowship programme– funding - Research reports
Intended outcomes, effect	<ul style="list-style-type: none"> - Improved learning and working environment for women in science and mathematics fields - Increased representation of women in science and mathematics fields at the undergraduate, graduate and faculty level - Policies and programs that attract and encourage talented women to pursue careers in mathematics and science disciplines.
Evaluation	N/A
Sources/references	http://www.indiana.edu/~owa/wisp/index.html

64. Women in Science at Yale (WISAY)	
Country/region	USA
Level of intervention	Institutional
Who is driving it?	A group of over two-hundred and fifty undergraduate, graduate, and post doctoral fellows who are interested in issues that pertain to women in science. Was founded in 1999 by three graduate students who wanted to create a forum for females in all disciplines of science.
Sector focus	Science in general
Target group	Undergraduate, graduate and post-doc Science students.
Type of initiative	University based organisation: Mentoring , support and networking
Description of initiative	WISAY was founded in 1999 by three graduate students who wanted to create a forum for females in all disciplines of science. WISAY creates a campus-wide network of scientists across many scientific disciplines and provides the opportunity for Yale scientists to meet with leading women scientists from Yale and around the country. Goals as an organisation include:

	<ul style="list-style-type: none"> - Networking with premiere women scientists through seminars and discussions - Mentoring Yale undergraduates who are interested in science - Supporting each other by sharing our own experiences and ideas - Making scientists aware of various career options available with a science PhD
Activities	<p>WISAY has two divisions: WISAY General and WISAY Mentoring. <i>WISAY General</i> organizes events for all WISAY members and aims to hold one event per month. Events include article discussions, afternoon teas, seminars, and networking events. <i>WISAY Mentoring</i> manages the WISAY Mentoring Programme in which Yale undergraduate's mentees are paired with graduate/post-doc mentors. Events held by WISAY Mentoring are united by the common theme of mentoring and aims to encourage undergraduate women to pursue careers in science.</p> <p>Mentoring Program: <i>The WISAY mentoring programme provides a fun and informal way to get to know undergraduate and graduate students interested in pursuing careers in science. This programme provides a unique and valuable opportunity for women starting out to directly interact with more experienced women scientists who are already integrated into the scientific community. Undergraduates are matched with graduate students and post-doctoral fellows at Yale to receive mentoring, encouragement, guidance and support. For mentors, being able to share their knowledge and experience with their mentee and know that they have made a difference is very rewarding. Matched pairs are encouraged to meet one on one as well as attend events organized by WISAY including social activities, lectures, and discussions. Food and beverages are provided at all meetings as well as great company!</i></p> <p>Seminars: <i>An important part of WISAY's mission is to spotlight prominent and successful women scientists from Yale and across the country in order to acquaint students with a variety of role models. Through seminar events and discussions, invited speakers have shared with us the experiences of their career paths in academia, industry, government, and nonprofit organisations. Past speakers have given us their unique perspectives on how opportunities for women have emerged over time, as well as commentary on the challenges that remain. WISAY seminars and networking sessions take place throughout the academic year and summer.</i></p> <p>WISAY hosts various themed social events once a semester. The purpose of these events is to allow members to interact with one another and gain access to informal networks of both support and information.</p>
Outputs	Discussions, Seminars, afternoon teas, networking events, mentoring programme
Intended outcomes, effect	<ul style="list-style-type: none"> - A network of scientists across many scientific disciplines - Increased support to women scientists through networking and mentoring support - Increased awareness of the various career options for science PhDs
Evaluation	N/A
Sources/references	http://wisay.sites.yale.edu/

65. Dartmouth Women in Science Project (WISP)	
Country/region	USA
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Science, math and engineering
Target group	Undergraduate and post-graduate science, math and engineering students
Type of initiative	University based organisation: Access to field, participation, retention, support and networking
Description of initiative	<p>Dartmouth College established the Women in Science Project (WISP) in 1990 to address the under-representation of women in science, mathematics, and engineering. Dartmouth designed WISP with a focus on retaining women in science and an emphasis on women in their first year. Recognizing that women leave science for many reasons, WISP encompassed a variety of programs providing undergraduate and graduate women throughout their academic careers with mentors and role models, information on educational and career opportunities in science, academic support, and a community of women engaged in the study of science. WISP grew to include faculty development programs and evaluation and dissemination activities that promote widespread, systemic improvements to the education of women in science.</p> <p>The mission of WISP is to encourage more Dartmouth women to persist in science, math, and engineering by creating and fostering a supportive academic and social climate that will aid women in pursuing science as a major and a career.</p>
Activities	<p>WISP's broad goal is achieved by enhancing the experiences of Dartmouth women, particularly in their first year, through a comprehensive set of proven intervention strategies, including:</p> <ul style="list-style-type: none"> - Mentoring - Early hands-on research experience - Role modeling - Access to information <p>Because reasons for women's attrition from science and engineering vary from one individual to another, no one retention strategy will be effective for all. WISP's design incorporates multiple strategies such as:</p> <p><i>WISP Newsletter:</i> The WISP Newsletter edited and produced by students, informs the campus community about WISP sponsored events, campus science colloquia, leave-term internship opportunities, profiles of faculty members and graduate students, articles on women in science and student perspectives. The newsletter is electronically distributed to more than 1,400 students, faculty, and administrators.</p> <p><i>First-Year Research Internships:</i> First-Year Research Internships allow first-year women to work closely with a scientist and gain hands-on research and laboratory experience. These paid part-time internships culminate in a presentation at Dartmouth's annual science poster symposium. The internship experience enhances students' understanding of the process of scientific inquiry, builds their confidence in the laboratory, and introduces adult mentors.</p> <p><i>Karen E. Wetterhahn Research Science Symposium:</i> The Karen E. Wetterhahn Research Science Symposium is an annual celebration of undergraduate scientific research at Dartmouth College. Named in honor of the late Professor of Chemistry Karen E. Wetterhahn, co-founder of WISP, the Women in Science Project initiated this symposium in 1992 to culminate the first-year research internship experience with an opportunity for the interns to present their work and share the excitement of doing science with others. Upper-class students who are conducting research through other programs, e.g., senior honors thesis research and the Presidential Scholars Program, are also invited to present scientific posters of their work.</p> <p><i>Peer Mentoring Program:</i> The Peer Mentoring Programme introduces first-year</p>

	<p>women to older peers who help them understand Dartmouth's academic environment and science curriculum. Peer mentors assist newly-matriculated students in learning about opportunities and confronting challenges. WISP implemented a group peer mentoring model last year that brings together one or two first-year students with several upper-class mentors to form a team with similar academic or career interests.</p> <p><i>MentorNet</i> : MentorNet is the award-winning e-mentoring network that is increasing retention and success rates for individuals in science, engineering mathematics and technology, especially for women and others underrepresented in these fields. MentorNet's One-on-One program links highly motivated protégés with mentors who are professionals in industry, government and higher education. In addition, MentorNet offers discussion groups and other useful resources.</p> <p><i>Visiting Women Scientists</i>: Visiting Women Scientists introduce women to academic and industrial role models in public forums and informal settings. Scientists provide students with inspiration, encouragement, and valuable perspectives on career paths, personal challenges, and success strategies.</p> <p><i>Faculty and Curriculum Development</i>: Through science teaching seminars, institutes and workshops, faculty listen, learn and share ideas from peers and invited speakers on science teaching. They gain new appreciation for common issues about the retention of students in the sciences and across scientific disciplines, particularly at the introductory level.</p>
Outputs	WISP Newsletter, First-Year Research Internships, Research Science Symposium, Peer Mentoring Program, MentorNet , Visiting Women Scientists , Faculty and Curriculum Development (seminars, workshops, talks)
Intended outcomes, effect	Increase in the retention of women in science, math and engineering by creating and fostering a supportive academic and social climate that aids women in pursuing science as a major and a career.
Evaluation	Monitoring
Sources/references	http://www.dartmouth.edu/~wisp/

66. Case Western Reserve University – ACES – Academic Careers in Engineering & Science Mentoring	
Country/region	USA
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Engineering and Science
Target group	Junior faculty women in Science and Engineering in HE
Type of initiative	University based initiative: Mechanism for junior women faculty to obtain field specific and institution specific career guidance.
Description of initiative	The ACES mentoring initiative was created to provide a mechanism for junior women faculty to obtain field specific and institution specific career guidance. Mentoring committees are charged with assisting and advising junior faculty regarding grants, publications, pre-tenure leave, committee service, student advising duties, and departmental promotion and tenure expectations. Mentors take a personal interest in the career development of the mentee, opening doors for the mentee by championing, sponsoring, and including the mentee with regard to new opportunities, contacts, and resources. In addition to the mentoring of junior women faculty, development committees are being created specifically to address the needs of women faculty at the full professor level.
Activities	Mentoring, Mentoring committees
Outputs	Mentoring relationships, mentoring committees
Intended outcomes, effect	<p>Career advancement for junior faculty women in HE, such as:</p> <ul style="list-style-type: none"> grants being awarded due to advice and support of network and

	<ul style="list-style-type: none"> mentoring increase in productivity (publication output) utilizing external and internal contacts and networks <p>Young women scientists taking initiative of their own career development</p> <p>Mentees becoming mentors and assisting other young scholars to advance their scientific careers</p>
Evaluation	N/A
Sources/references	http://www.case.edu/admin/aces/mentoring.htm?nw_view=1339844692&

67. Centre for Study of Women, Science & Technology at Georgia Institute of Technology (WST)	
Country/region	USA
Level of intervention	Institutional, national Policy and practice
Who is driving it?	Academia
Sector focus	S&T general
Target group	Students interested in the study of S&T and how its links to other disciplines
Type of initiative	<p>University based – educational centre</p> <p>Expand research on women, S&T</p> <p>Research-based practice and policy toward improving participation and performance of women in S&T education and careers</p> <p>HR development for men and women in S&T</p>
Description of initiative	<p><i>Mission:</i> The Georgia Tech Center for the Study of Women, Science, and Technology links issues in the study of science and technology with those of gender, culture, and society. In key characteristics, the WST Center is interdisciplinary, cooperative in partnerships with students, and collaborative across Georgia Tech Colleges and in alliances with Atlanta-area colleges and universities and Georgia Tech Alumnae. <i>Goals:</i></p> <ul style="list-style-type: none"> - Expand and enhance research on women, science, and technology - Establish and expand collaboration among faculty and between students and faculty through Center research and programmatic initiatives, and through joint ventures with related Georgia Tech programs - Enrich and establish the national prominence of its interdisciplinary research programs through programmatic ventures, such as the WST Lecture Series - Provide research-based practice and policy toward improved participation and performance of women in scientific and technological education and careers - Support the instruction and development of students in the classroom and through partnerships with faculty in WST research and programmatic initiatives - Link Atlanta-area researchers, entrepreneurs, and technologists with shared interest in improving human resources of both women and men for science and technology, thereby connecting Georgia Tech to regional universities, industry, and government.
Activities	The Women, Science, and Technology Learning Community (WST Lrn C) is an innovative joint venture of the Center for the Study of Women, Science, and Technology (WST Center) and the Georgia Tech Department of Housing. The WST Learning Community enhances the academic and professional development of GT

	<p>undergraduates by creating networks for students and for student and faculty interaction. Modelled on residence hall programs for women in science and engineering, the WST Lrn C offers programs addressing personal and professional issues for women students entering scientific and technological fields. Female undergraduates from any major interested in the programs of the WST Center are eligible to apply in spring for housing in the WST Lrn C.</p> <p><i>Sample topics covered in WST Courses:</i></p> <ul style="list-style-type: none"> • Women in the history of science and technology • Organisational influences affecting the participation of women in scientific and technological careers • Gender issues in professions • Women and the organisation and management of science and technology • The gendered impact of scientific and technological policy • Feminist perspectives on science and technology • Cultural analyses of gender, race, and class factors in the practice of science and technology
Outputs	Lectures, research, support programmes and workshops
Intended outcomes, effect	<ul style="list-style-type: none"> • Expanded research on women, science, and technology • Expanded collaboration among faculty and between students and faculty through Center research and programmatic initiatives, and through joint ventures with related Georgia Tech programs • Enrich and establish the national prominence of its interdisciplinary research programs • Research-based practice and policy toward improved participation and performance of women in scientific and technological education and careers • Support the instruction and development of students in the classroom and through partnerships with faculty in WST research and programmatic initiatives • Link Atlanta-area researchers, entrepreneurs, and technologists with shared interest in improving human resources of both women and men for science and technology, thereby connecting Georgia Tech to regional universities, industry, and government.
Evaluation	N/A
Sources/references	http://www.wst.gatech.edu/

68. Association for Women in Science (AWIS)	
Country/region	US
Level of intervention	National, implementation
Who is driving it?	Industry, academia and public sector
Sector focus	Science, math, engineering and technology
Target group	Students Advanced professionals
Type of initiative	Association/grouping Professional development and access
Description of initiative	<i>Mission:</i> AWIS is a national advocacy organisation championing the interests of women in science, technology, engineering, and mathematics all disciplines and employment sectors. By breaking down barriers and creating opportunities, AWIS strives to ensure that women in these fields can achieve their full potential.

	<p><i>Vision:</i> We envision a day when women will participate fully in science, technology, engineering, and mathematics as manifested through equal opportunity, pay equity, and recognition commensurate with their accomplishments.</p> <p><i>Strategic goals and objectives:</i></p> <p><i>Goal: Advocate on behalf of all women in STEM</i></p> <p>Objectives:</p> <ul style="list-style-type: none"> - AWIS believes that STEM are prevented from reaching their full potential, not because they are less able or less willing, but because of barriers that exist in scientific workplaces. We will carry this message to Congress, to the media, and to employers by: increasing the interaction with national legislative bodies and federal agencies; developing mechanisms to increase participation and representation of AWIS members in advocacy initiatives; strengthening current partnerships and developing new alliances to leverage effectiveness - Advocate for the retention and advancement of women in scientific leadership positions in industry, npo's and academia - Promote gender specific data collection by national, state, and private entities - Advocate for STEM institutions and corporations to develop policies that increase gender representation on boards, conference programmes and committees - Develop and provide public policy statements on subjects including funding for programs targeted towards increasing women and minority representation in science, and the need for family friendly policies <p><i>Goal: Increase public and private support for women in STEM</i></p> <p>Objectives:</p> <ul style="list-style-type: none"> - Increase and enhance the association's web and media presence - Promote relevant research and establishment of accessible data bases - Identify women in STEM to serve as spokespersons <p><i>Goal: Promote implementation of workplace and educational best practices</i></p> <p>Objectives:</p> <ul style="list-style-type: none"> - Compile and disseminate comprehensive best practices for industry, government, academia, and NPO's to use in attracting, retaining and promoting women in STEM - Partner with diverse institutions and organisations seeking to implement best practices - Facilitate opportunities for continuing information exchange about emerging best practices <p><i>Goal: Strengthen connections among women across STEM disciplines and work sectors</i></p> <p>Objectives:</p> <ul style="list-style-type: none"> - Build membership in AWIS - Build chapters that provide value to AWIS members - For both AWIS national and chapters, develop opportunities for cross-discipline and cross-sector networking - Build collaborations with professionals, leaders of organisations, and supporters of women in STEM <p><i>Goal: Increase the number of women in STEM</i></p> <p>Objectives:</p>
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	<ul style="list-style-type: none"> - Communicate that STEM has great opportunities for women - Identify opportunities to apply best practices to the retention of women in STEM <p><i>Goal: Increase the number of women in STEM who assume leadership roles at the national, local and institutional levels</i></p> <p>Objectives:</p> <ul style="list-style-type: none"> - Promote leadership skills and professional development by serving as a resource - Increase the number of nomination, recognition, and recommendation of women in STEM for leadership roles and prestigious awards
Activities	<p>Offer resources for students: career opportunities and options, selection of academic coursework, research opportunities, self-image and self-confidence</p> <p>Resources for advanced professionals: professional contacts and networking, balancing work and family, getting grants/getting published/getting noticed, negotiating hurdles in the workplace</p> <p>Though grants from the Sloan Foundation and NSF, in the 1990s AWIS encouraged chapters to undertake locally based mentoring activities and provided resources to chapters. Chapters engage in a variety of activities that involve:</p> <ul style="list-style-type: none"> - direct one-on-one mentoring - group mentoring in which an audience receives advice, via career days, discussions, lectures, school visits, workshops for teachers, networking/social events etc - indirect mentoring in which the visibility of a woman scientist encourages women scientists e.g. almost every chapter provides judges for local science fairs thus serving mentors for the girls who are exhibitors - other activities teach attendees how to be effective mentors to younger women and provide the relevant resources.
Outputs	<ul style="list-style-type: none"> - Advocacy and lobbying activities - Gender specific data on national, state and private sector level - Policy review and reform - Web and media products - STEM spokespersons - Best practices guides for attracting, retaining and promoting women in STEM - Increase AWIS membership - Cross-sector and cross-discipline networking through chapters - Professional and leadership development - Resources for students on career opportunities and options, selection of academic coursework, research opportunities, self-image and self-confidence - Resources for advanced professionals regarding professional contacts and networking, balancing work and family, getting grants/getting published/getting noticed, negotiating hurdles in the workplace - One-on one mentoring - Group mentoring such as career days, discussions, lectures, school visits, workshops for teachers etc - AWIS Magazine - A Hand-up – paper mentor
Intended outcomes, effect	<ul style="list-style-type: none"> - Women participating fully in science, technology, engineering, and mathematics as manifested through equal opportunity, pay equity, and recognition commensurate with their accomplishments. - Increase in the retention and advancement of women in scientific leadership positions in industry, NPOs and academia by applying best practice principles - Increase in the public and private support for women in STEM - Strengthened connection among women across STEM disciplines and

	work sectors <ul style="list-style-type: none"> - Increase in the number of women in STEM - Increase in the number of women in STEM who assume leadership roles at the national, local and institutional levels - Increase the number of nomination, recognition, and recommendation of women in STEM for leadership roles and prestigious awards
Evaluation	N/A
Sources/references	http://www.awis.org

69. Women in Science and Technology (WIST)	
Country/region	US
Level of intervention	National, institutional
Who is driving it?	Argonne National Laboratory & US Department of Energy
Sector focus	Science
Target group	Young girls and students, policy and decisionmakers, senior scientists
Type of initiative	Awareness-raising, skills development, increase interest and access, equality, mentoring and support
Description of initiative	<p>Argonne's Women in Science and Technology (WIST) programme was created in 1990 to recruit, retain, and promote women in an effort to diversify and strengthen the Laboratory's scientific workforce. The programme aims to promote the success of women in scientific and technical positions at Argonne, and outside as well. Through WIST, the Laboratory strives to encourage and develop the full potential of women in science and technology. WIST is also responsible for initiating activities that reach out to young women and promote career development.</p> <p>Goals:</p> <ul style="list-style-type: none"> - Provide leadership and resources to Argonne to promote the success of women in scientific and technical positions at the Laboratory and elsewhere - Support and implement programs that encourage, develop, and utilize the full potential of women in science and technology - Promote movement toward equity at all levels within Argonne so as to contribute to a best-in-class research and development institution.
Activities	<p>Current WIST programme activities support outreach efforts of the Laboratory and include:</p> <p><i>Science Careers in Search of Women conference:</i> Every year in the spring, high school women and their teachers and counselors from surrounding communities participate in the Science Careers in Search of Women Conference (SCSW). The emphasis is on exploring opportunities and options for women choosing a career in science and engineering. A major theme is the discussion of what life is like when pursuing scientific professions. In addition, information on employment trends and educational requirements is presented. Speakers and panelists come from a variety of scientific disciplines. Ample time is allowed for participants to meet the speakers and learn firsthand about the rewards for women in science.</p> <p><i>Science Careers in Search of Women Founders Award:</i> Established in 2007, this award honors individuals who have demonstrated a lifetime commitment to mentoring women and to advancing women leadership and career opportunities in</p>

	<p>the sciences and engineering, because “the future depends on what we do in the present.</p> <p><i>Introduce a Girl to Engineering Day:</i> Middle school girls from surrounding communities come to Argonne every year to participate in Introduce a Girl to Engineering Day (IGED). This event is held on the third Thursday in February each year, and is part of National Engineers Week. The focus of the day is to illustrate with interactive and hands-on presentations and tours the many aspects of engineering and how it can be a rewarding career for women. Students are paired with Argonne engineers and scientists who mentor them during the day and provide an opportunity for small-group conversation. Students also have an opportunity to meet like-minded peers, helping them to discover that their interest in science and many other girls in their age group share engineering.</p> <p><i>Maria Goeppert Mayer Postdoctoral Fellowship:</i> recognizes and promotes women's technical excellence</p> <p><i>Friday First Forum:</i> a monthly networking brown-bag lunch focusing on matters of interest to Argonne scientific and technical women. All employees are welcome.</p> <p>Additional activities supporting retention and promotion efforts include:</p> <ul style="list-style-type: none"> - Networking and mentoring programs to nurture and support existing women staff - Career Development Seminar Series to identify and develop leadership capabilities of women staff - Periodic review of the status of women at the Laboratory to ensure equity in merit status and research opportunities
Outputs	Publications, networking opportunities, conference proceedings, awards, career days, fellowships, mentoring, career development training
Intended outcomes, effect	Promotion of women in scientific and technical positions at the Laboratory and elsewhere – both in terms of quality and full potential and equality
Evaluation	N/A
Sources/references	http://www.wist.anl.gov/

70. Wisconsin Women in Higher Education Leadership (WWHEL)	
Country/region	US
Level of intervention	Institutional level
Who is driving it?	University of Wisconsin
Sector focus	Higher Education
Target group	Women in leadership in HE or pursuing such a position
Type of initiative	Networking and support – various tools
Description of initiative	WWHEL provides opportunities for networking, information sharing and support for women in leadership and encourages women faculty and staff to pursue leadership positions. Specifically, WWHEL can help and support women to develop specific skills, connect with colleagues who can provide valuable insight into the

	administrative role, identify career development contacts, and access state and national resources.
Activities	<p>WWHEL sponsors an <i>annual fall conference</i> and also informs women of other national, regional, state or campus professional development opportunities. Each fall WWHEL sponsors a state conference. The conference provides national keynote speakers, concurrent sessions and panel presentations on leadership in higher education. The campus hosting the WWHEL State Conference works with the WWHEL Board of Directors to establish a budget. The campus conference planning committee has at least two representatives from the WWHEL Board of Directors. The Board representatives have access to a common format/timetable which will be of assistance in planning and delivering the conference. The state Conference planning committee should strive to have the following Wisconsin institutions represented in the program: UW Universities/Colleges, Technical Colleges and private Universities/Colleges. At the conclusion of the conference the host campus will be awarded a grant of \$3,000 from WWHEL. If more than one campus is involved in hosting the conference the grant will be divided among the campuses. These funds are to be used by the campus women's group to support and encourage women to grow as leaders in higher education. Examples of such activities included sponsoring speakers/panels on campus, hosting recognition receptions/dinners, funding women to attend leadership conferences/workshops, providing scholarships for continuing education, etc. Within a year after receiving the funds, the campus will submit a brief report to the WWHEL Board of Directors outlining how the funds were used. When individuals attend their first annual fall conference, they receive a discount on the Wisconsin-based national publication, <i>Women in Higher Education</i>, which offer many insights and ideas that women can use and share.</p> <p>WWHEL maintains a <i>website and a listserv</i> which facilitate communication on issues of interest. WWHEL supports campuses by co-sponsoring topical spring regional workshops which educate, encourage and support women in leadership and helps women move into leadership positions.</p> <p><i>Wisconsin Women in Higher Education Leadership Outstanding Achievement Award:</i> Nominees should be women working at an institution of higher education (UW, private, or technical) or in the public/private sector who have made significant contributions to higher education. Nominees may include women who work in any job classification (i.e., support staff, non-tenured instructor and/or researcher, faculty, administrator). Award Criteria (one or more of the following): (1) Single event that changed the working environment, leadership opportunities and/or advancement and/or inclusion of women in higher education or (2) Statewide initiative that has had an impact on the status of women or (3) Lifetime career that supports an improved climate and/or opportunities for women at institutions of higher education in Wisconsin.</p>

	<p><i>Local Campus Stipends:</i> The WWHEL Board of Directors, through college and/or university Institutional Representatives (IRs), encourages activities that support and address issues important to the advancement of women at all levels. To that end, the Board has authorized stipends to be used to support activities (book clubs, discussion groups, materials, etc.) as decided by the local campuses. A maximum of fifteen (15) stipends annually will be awarded for a maximum amount of \$500 per institution. The WWHEL Board has the right to alter the number of stipends based on funding availability.</p> <p><i>WWHEL Professional Development Grants:</i> To provide financial support for women to participate in professional development opportunities to advance in leadership roles in Higher Education. Awards of up to \$5000 per person will be made based on availability of funds at each granting cycle.</p>
Outputs	Conference proceedings, website, information dissemination, awards, stipends, grants
Intended outcomes, effect	Support and encouragement for women in leadership positions in HE
Evaluation	N/A
Sources/references	http://www.wwhel.org/index.htm

71. Flora Stone Mather Center for Women (Case Western Reserve University) (FSM)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	HE and STEM
Target group	Women in HE
Type of initiative	Support, advocacy and lobbying, networking
Description of initiative	The mission of the Flora Stone Mather Center for Women at Case Western Reserve University is to support and empower women through education, advocacy and leadership. The Flora Stone Mather Center for Women will serve as a resource to all women at the university by offering a variety of initiatives focused on leadership development and recognition, gender equity in Science, Technology, Engineering and Mathematics (STEM) fields, and women's health. We will be inclusive of all women and encourage them to become actively engaged in the center's efforts while achieving their academic, professional and personal goals that will transform themselves and society.
Activities	<i>WISER (Women in Science and Engineering Roundtable):</i> is open to all female CWRU students (undergraduate, graduate and professional) with a major or planning a career in science, technology, engineering, medicine or math. New members and guests are always welcome at all WISER events, as are all interested CWRU faculty and staff. WISER sponsors a variety of programs and events, including peer and professional mentoring, monthly meetings, social outings, field trips and opportunities for professional and educational enrichment.

	<i>Mather Spotlight series on women's scholarship:</i> The Mather Spotlight Series was endowed through the generosity of the Flora Stone Mather Alumnae Association in 1989. The resulting Mather Centennial Endowment Fund allows us to celebrate and learn from women's scholarship throughout the year. The series highlights the work of women faculty, promotes understanding of women's accomplishments (and struggles) in the academy, and promotes networking among women faculty and students. The series features lectures by CWRU women faculty and an annual awards reception honoring outstanding women scholars.
Outputs	Discussions, meetings, lecturers, lobbying and advocacy activities
Intended outcomes, effect	Gender equity in STEM, leadership development of women in HE, support to women working in HE
Evaluation	N/A
Sources/references	http://www.case.edu/provost/centerforwomen/index.html

72. WiSE (University of Southern California)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Science and Engineering
Target group	Women in HE – faculty, postdoctoral fellows, graduates and undergraduates, and even high school girls
Type of initiative	Grant programme
Description of initiative	The WiSE programme is a groundbreaking effort to increase the representation and success of women in science and engineering at USC through a series of creative programs that enable women to thrive at every stage of their careers. Committed to developing fresh approaches to policies and to building a supportive environment for both women and men, the WiSE programme is driving USC to the leading edge of diversity in science and engineering. The primary goal of the WiSE programme is to increase the number of women in tenured and tenure-track faculty positions. The gift is going to work for USC, enabling the university to compete for highly regarded women scientists and engineers and retain those who might be tempted to move elsewhere.
Activities	<p>WiSE administers a variety of grant programs aimed at faculty, postdoctoral fellows, graduate and undergraduate students, as well as high school and middle school girls. These programs have been developed to encourage women to select USC as an institution in which to study, conduct research, and develop successful careers. In order to be eligible for WiSE awards, students must be enrolled full-time and faculty must hold appointments in WiSE-eligible department. WiSE-eligible departments include those within the Viterbi School of Engineering and the Biology, Chemistry, Earth Sciences, Mathematics, Kinesiology, and Physics & Astronomy departments within the USC Dana and David Dornsife College of Letters, Arts, and Sciences.</p> <p><i>WiSE Distinguished Lecture Series:</i> In 2009-2010, in celebration of its 10th</p>

	<p>Anniversary, the Women in Science and Engineering Programme collaborated with departments across the Viterbi School of Engineering and USC Dornsife College to sponsor a series of distinguished lectures featuring prominent women scientists and engineers visiting campus that year. Owing to the program's success, WiSE would like to continue a similar suite of WiSE lectures on an annual basis. The WiSE Programme will continue to host our annual WiSE Distinguished Lecturer and other speakers, but we know that many departments have named and distinguished lecture series that feature prominent women scientists. Thus, WiSE invites WiSE-eligible departments to make their distinguished guests also WiSE speakers. WiSE will advertise such speakers across schools and departments, thus highlighting the many excellent scientists and engineers who visit USC across various disciplines; through advanced promotion we will help increase attendance and widen audiences beyond your field and department. In addition to assisting with advertising, WiSE would like to offer to host luncheons, receptions, teas, and similar events in association with existing lecture series, for WiSE featured speakers.</p> <p>The mission of WiSE has always been to increase the representation of women in tenure and tenure-track positions within the academy in the disciplines of math, the sciences, and engineering. By sponsoring social events in tandem with talks that feature prominent women scholars, WiSE hopes to present the USC community with cutting-edge research; to stimulate discussion among faculty, postdoctoral scholars, graduate and undergraduate students, and staff; to motivate young researchers to pursue academic careers; to create opportunities for networking among junior scholars; and to promote collegiality within the academic community more generally.</p> <p><i>New Faculty Recruitment:</i> The WiSE Programme provides funds to supplement and embellish offers made to new faculty in the Viterbi School of Engineering and in the natural sciences and math in the USC Dana and David Dornsife College of Letters, Arts, and Sciences who will increase the representation of women in these fields. By providing additional funds to a new faculty member for start-up research costs, WiSE hopes to maximize the chances that such offers will be accepted. Guidelines that will be used in considering requests by the Deans for funding are linked below.</p> <p><i>WiSE Support for Facilitating Diversity in Faculty Searches:</i> The WiSE Programme provides competitively awarded support to WiSE-eligible departments at USC that propose and implement creative ideas for "casting the net widely," thus increasing the representation of women in science and engineering faculty searches. Activities for which funding may be requested are expected to vary from department to department, as effective approaches would depend on individual disciplines. Proposals should include a brief description of the departmental plan to increase diversity in faculty hiring and a strong justification of why and how receipt of funds will serve to cast the net widely to increase the representation of women in science and engineering faculty searches. Departments may submit no more than one application per academic year.</p>
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	<p><i>Postdoctoral Support:</i> WiSE funds are available for partial salary support of postdoctoral fellows, also financially supported by a USC faculty mentor, for a period of two years. Up to four postdoctoral fellowships can be awarded each year to excellent candidates who plan to work with USC faculty members who are known to be good mentors and who have a strong track record of successfully placing students and postdoctoral fellows in academia. Two of the four postdoctoral fellows will be in the Viterbi School of Engineering and two in the USC Dana and David Dornsife College of Letters, Arts, and Sciences. The primary goal of the postdoctoral programme is to attract outstanding postdoctoral fellows to USC, and to prepare them for successful academic careers by providing them excellent opportunities and mentoring.</p> <p><i>Merit Fellowship for Current Doctoral Students:</i> The Merit Fellowship for Current Doctoral Students is offered to current Ph.D. students at USC who demonstrate exceptional work in their field. Two candidates will be chosen from the USC Dana and David Dornsife College of Letters, Arts, and Sciences and two from the Viterbi School of Engineering. Candidates are nominated by the faculty. Each one-year WiSE Fellowship carries a stipend of \$5,000. To be eligible for the Merit Fellowships students must plan to be enrolled full-time for both the upcoming Fall and Spring semesters, be in at least their fourth year of study or passed their qualifying exams, and be funded by a 50%-time research assistantship, teaching assistantship, or fellowship during that period.</p> <p>The purpose of the WiSE Merit Fellowship is to provide advanced doctoral students with an opportunity to be recognized for their achievements.</p> <p><i>Merit Award for Excellence in Postdoctoral Research:</i> The WiSE Merit Awards for Excellence in Postdoctoral Research are offered to current Postdoctoral researchers at USC who demonstrate exceptional work in their field. Candidates must be working under the mentorship of a faculty member in a WiSE-eligible department of the USC Dana and David Dornsife College or Letters, Arts, and Sciences or in the Viterbi School of Engineering. A maximum of four awards will be given each year. Candidates are nominated by the faculty and each department may nominate up to two candidates. Each WiSE Award will be for \$3,000. The purpose of the WiSE Merit Award for Excellence in Postdoctoral Research is to provide junior researchers an opportunity to be recognized for their achievements. The WiSE Programme hopes the awards will provide support and motivation to researchers on an academic trajectory and increase the representation of women in science and engineering.</p> <p><i>Undergraduate Research Grants:</i> Up to fifteen Undergraduate Research Fellowships are granted each year in both USC Dornsife and in the Viterbi School of Engineering to support summer and academic year research (Five awards each in the fall, spring and summer terms). The goal is to familiarize students with laboratory research and link them with a mentor early on. It is hoped that through the</p>
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	<p>experience of first-hand research at the undergraduate level, the chances will increase that students will choose to pursue a graduate degree in science or engineering.</p> <p><i>Child Care Subsidy:</i> This programme provides childcare subsidies to doctoral students, postdoctoral fellows, and faculty members with children in USC Child Care Programs. Supplemental Childcare Grants are available each year for a select number of doctoral students in good standing, postdoctoral fellows, and faculty members who have primary childcare responsibilities for a child in the infant through pre-school age range. Priority is given to graduate students and postdoctoral scholars. Each WiSE Childcare Grant will be paid in a monthly supplement which is equivalent to a \$4,000 subsidy over a 12 month time period and can be prorated mid-year.</p> <p><i>WiSE Support for Faculty Pregnancy, Childbirth and Adoption:</i> Faculty in science and engineering who have or adopt a child can face unique challenges. The existence of the WiSE Programme and the networking and support that are now available to WiSE faculty at USC present a special opportunity to address the situation and work to overcome many of the obstacles that potentially adversely affect the careers of WiSE faculty with families. WiSE will provide guidance to help the faculty member navigate negotiations with faculty member's chair or dean, and may when necessary contribute to the cost of hiring a lecturer to teach the course(s) of the WiSE faculty member for the period of the agreed modified duties, and/or give priority funding through the WiSE Major Support for Faculty Programme during the first two years after the birth or adoption of a child to offset grants/contracts negatively affected by childbirth or adoption.</p> <p><i>Fellowship Support to Accommodate Pregnancy, Birth of a Child, and Adoption for Ph.D. Students and Postdoctoral Scholars:</i> One of the most important issues to increasing the representation of women in science and engineering is the balance of career and family obligations. For young scientists and engineers, this balance primarily involves childbirth, adoption, nursing and infant care. Specific to science and engineering is the need to avoid potentially hazardous situations during pregnancy and nursing such as exposure to chemicals, electromagnetic radiation, or other possible damaging settings. The WiSE Programme has developed this fellowship support programme to help Ph.D. students or postdoctoral scholars and their advisors solve any conflicts that arise between the constraints of pregnancy, childbirth, adoption, nursing and infant care and the continuing work of the research program. The Fellowship Programme engages participants at all levels: advisor, department chair, dean, and university administration, in an effort to help a Ph.D. student or postdoctoral scholar who is pregnant and gives birth, or adopts a child to continue her or his career with the least possible interruption. WiSE support addresses only the need for support during the time when students or scholars cannot work on their research or as a laboratory-based teaching assistant.</p>
Outputs	Extensive funding, grants and awards

Intended outcomes, effect	Increased representation and success of women in science and engineering at USC through a series of creative programs that enable women to thrive at every stage of their careers. Building a supportive environment for women in Science and Engineering through funding – thereby increasing the number of women in tenured and tenure-track faculty positions.
Evaluation	N/A
Sources/references	http://www.usc.edu/programs/wise/

73. Office of Women in Higher Education (OWHE)	
Country/region	US
Level of intervention	National and Institutional
Who is driving it?	Part of American Council on Education
Sector focus	HE
Target group	Women in HE – mid and executive leaders
Type of initiative	Network, training and support in leadership development
Description of initiative	<p>Since 1973, the Office of Women in Higher Education (OWHE) of the American Council on Education (ACE) has provided national leadership in the advancement of women into executive positions and campus presidencies. Mission is to:</p> <ul style="list-style-type: none"> - identify women leaders - develop their leadership abilities - encourage the use of those abilities - advance women's careers - link women to each other - support women in mid- and executive-level positions throughout their careers.
Activities	<p><i>Identifying Women Leaders in Higher Education:</i> ACE identifies, develops, encourages, advances, links and supports women leaders in higher education through its Office of Women in Higher Education (OWHE), its commission, individual state networks, and The ACE Network, a state-based system of interlocking networks supported by campus presidents. Since 1977, the goal of ACE and its partners has been to increase the number of senior-level women by expanding the pool of qualified candidates. ACE/OWHE Leadership Awards: The awards recognize outstanding and innovative programs, colleges, universities, governing boards, search firms, and individuals who have contributed significantly to the advancement and support of women or women's issues in higher education.</p> <p><i>Developing the Leadership Skills of Women in Higher Education:</i> The following list details opportunities for leadership development in higher education that aim to enhance the skills and knowledge necessary to move into mid- and senior-level positions:</p> <ul style="list-style-type: none"> - <i>The ACE Fellows Program</i> is a year-long higher education leadership development program. It identifies and prepares senior faculty and administrators seeking to strengthen higher education through leadership. - <i>ACE (OWHE) National and Regional Leadership Forums</i> play an important role in identifying and promoting women for senior-level

	<p>positions. Forums are invitational and held twice each year. The National Forums help women to assume presidencies, vice presidencies, and major deanships, while the Regional Forums serve women aspiring to deanships, associate deanships, and associate academic officer positions. National Leadership Forums have served as ACE's principal means of identifying outstanding women and promoting their advancement to the highest levels of leadership in U.S. colleges, universities, and associations since 1977. National Forums are held at the National Center for Higher Education in Washington, D.C. They provide an opportunity for women leaders to become acquainted with one another and with women and men in major leadership roles. Forums continue to play a critical role in establishing networks of women and men committed to identifying talented women administrators and providing the support necessary for their advancement. Some of the topics covered in this two and a half day leadership programme include: career mapping, fundraising, media training, integrating strategic planning and aligning resources, creating competitive edge, contract negotiation.</p> <ul style="list-style-type: none"> - <i>The individual state networks implement ACE State Network Leadership Development Programs</i> for mid- and senior-level women administrators as a part of ACE's Office of Women in Higher Education. - <i>Chairing the Academic Department</i>, a programme designed for division and department chairs and deans and focuses on departmental leadership. These workshops support the development of the chair as an academic leader within the department and within the institution as a whole. - The Center for Advancement of Racial and Ethnic Equity (CAREE) of the American Council on Education (formerly ACE's Office of Minorities in Higher Education) is a major national source of information on the educational status of minorities, exemplary programs aimed at improving the campus climate for persons of color, and addressing the challenges faced by academe in its efforts to increase participation rates and degree attainment by U.S. ethnic minorities. <p><i>Linking:</i> The concept that underlies the Linking element of the ACE Network IDEALS is basic: women working together today can improve the landscape not only of their own lives or of higher education, but also of the entire future that succeeding generations will inherit. Internal linkages work on two levels. The first connects individual women in higher education to one another through the events offered by their ACE State Network, without the strictures of a particular academic discipline, administrative silo, or home campus. Such events may take the form of, for example, statewide conferences, Network committee meetings, sessions for institutional representatives, receptions for new women presidents, or luncheons for women of color. This level also includes the interaction of coordinator and planning board with their presidential sponsor, Executive Board liaison, and OWHE. Additionally, Regional and National Leadership Forums link participants both to one another and to presidents, senior leaders with particular expertise, search consultants, and OWHE staff members.</p> <p>The second links Network to Network, primarily through the State Coordinators, who gather annually for the Coordinators' Conference to exchange ideas, widen their personal networks, and engage in professional development. However, Network to Network connections also make it possible for a member in one state to get information about potential position openings, to identify possible candidates from</p>
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	<p>one or more other states, to recruit speakers and experts, or to have an immediate source of support when moving into a new position across the country. [If we get the blackboard site up, this is where info on that would go.]</p> <p>As essential as these internal links are to the purpose of the ACE State Networks, they depict only half the goal. Network women need to ally themselves with women and groups from outside higher education when their agendas are in alignment.</p> <p><i>Support:</i> The possibilities for alliances that better the life of one woman or all women remain just that—possibilities—until one group of women decides to act.</p> <p><i>ACE (OWHE) Women Presidents' Roundtables</i> provide college presidents with the opportunity to share perspectives on a particular topic or concern, to network, and to consult with ACE on presidential staying power.</p> <p><i>The Business–Higher Education Forum</i> is a membership organisation of academic and corporate chief executives that addresses areas of critical concern between the sectors (diversity, for example).</p> <p><i>Creating Options: Models for Flexible Faculty Career Pathways</i>, an ACE/OWHE project, funded by the Alfred P. Sloan Foundation.</p> <p><i>Commission on Women in Higher Education:</i> Since the inception of the Office of Women in Higher Education (OWHE), members of the Commission on Women in Higher Education have served as advisers. The Commission, whose members are appointed by the president of ACE, provides counsel to OWHE and ACE on policies and programs related to women in higher education. It also assists with the evaluation of current programs, suggests new programs for consideration, and advises on matters concerning advancement and equity for academic women.</p> <p><i>Summit for Women Presidents:</i> OWHE hosts periodic Summits for Women Presidents, taking advantage of what retired and current presidents have learned and can share-and what soon-to-be-presidents can offer-on pipeline and support issues for women moving toward or serving in an academic presidency or chancellorship. Discussions include but are not limited to: Strategies for identifying women with leadership potential; Strategies for developing the skills and breadth of experience of such women; Strategies for advancing women along the administrative pathways; Strategies for recognizing the support necessary to assure retention along the path to the presidency; interaction with current and former women presidents and chancellors on succession planning.</p>
Outputs	Networks, fellowships, leadership forums, leadership development programs, roundtable discussions, conferences and summits
Intended outcomes, effect	Potential female leaders in HE identified, skills development of women in HE leadership positions, career advancement for women in HE, support and networking for women in leadership in HE.

Evaluation	N/A
Sources/references	http://www.acenet.edu/Content/NavigationMenu/ProgramsServices/OWHE/OWHE_main1.htm

74. University of Alberta – Women in Science and Engineering (UA-WiSE)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Science and engineering
Target group	Women in science and engineering, also specific focus on HE
Type of initiative	Support, network, mentoring
Description of initiative	<p>UA-WiSE is an ongoing learning and support group for all women in the fields of science and engineering. Undergraduates, graduate students, post-doctoral fellows, academic and technical staff from the university, attend Meetings and events. Students and staff from other post secondary institutions and high schools and women in industry are also very welcome. The events and format of the events changes from year to year, depending on the decisions by the executive and committee members. Events often begin with informal suppers and include: An open house at the start of the year; A mixer with graduate students; Talks from women scientists engineers, faculty, or government employees; Panel discussions; and A job search seminar with CAPs and Engineering Co-op.</p>
Activities	<p><i>WISER</i> is a sub-community of WISEST aimed at serving the needs of early-career professionals. The WISER Network is designed to connect early-career women in STEM (science, technology, engineering and mathematics) with each other and with the information, resources, support, and professional development opportunities they require advancing in their careers. WISER members are from academia, industry, and government roles at any stage of their careers in STEM fields. WISER welcomes both mentors at advanced stages of their careers and mentees who are at the early-career stages. WISER has “Mentor in Residence” volunteers who are more advanced in their careers and are prepared to offer mentoring. The WISER Executive Committee oversees WISER activities. Activities include information sessions, discussions groups, networking activities, and professional development workshops for the WISER community are to be planned monthly.</p> <p><i>Resource Network:</i> This is a new section on the WISEST website that includes information on career-decision making, mentoring, and descriptions of their own career paths from women in the sciences, engineering, and technology. This is a pilot project which has been designed by Penny Cholmondeley, a graduate student in the Master of Arts in Communications & Technology Programme offered by the Faculty of Extension at the University of Alberta. Many people have contributed to the various sections within the Resource Network. The opinions expressed are those of the authors and may not necessarily represent those of WISEST.</p>
Outputs	Meetings, social functions, mentoring, online resource network, professional development workshops

Intended outcomes, effect	Support for women in Science and Engineering studies and careers
Evaluation	N/A
Sources/references	www.wisest.ualberta.ca/UA-WiSEWISERNetworks.aspx

75. Duke Women in Science and Engineering (WiSE)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia, students
Sector focus	SET
Target group	Students and young graduates
Type of initiative	Support, networking, professional development
Description of initiative	<p>The group originated from several women-in-science initiatives sponsored at the university from 1989 through 1993. At that time, students, faculty, and administrators agreed that Duke needed to accomplish two goals: increase the number of women faculty members and students in science and engineering, and provide programmatic support for open discussion of science and gender issues. WiSE serves as a liaison between women science and engineering students and the administration, and sponsors events in which women faculty members and students in science and engineering can come together and share experiences and ideas for change. The organisation is run by a graduate student programme coordinator (paid), and a group of volunteer graduate students and post-docs, aided by administrative support from the Women's Center and financial support from a variety of Duke University offices.</p>
Activities	<p>From building confidence and learning how to negotiate to exploring alternative careers, WiSE organizes many events to help develop well-rounded and informed leaders.</p> <p><i>On Being a Female Scientist:</i> Distinguished female scientists from around the Triangle describe their career paths and the challenges they have faced as women in the sciences or engineering. Work/life balance is a common focus. The format is casual and we leave plenty of time for Q&A.</p> <p><i>Health & Wellness Seminars:</i> Being a graduate student forces us to think of how to best maintain our health and wellness. This workshops aim to help our members understand how to create a healthy balance between work and life while excelling at both!</p> <p><i>Developing a Professional Online Presence:</i> With an increasing trend of developing online-accessible portfolios and resumes, this series of workshops and instructional seminars is aimed at informing our members how best to develop an appropriate, professional online presence for current and future employers.</p> <p><i>Networking and social events:</i> Every year, WiSE puts on events with other</p>

	<p>professional organisations in the Triangle area for the development of organic mentorship experiences.</p> <p><i>If I Knew Then What I Know Now:</i> This is an annual WiSE event. Incoming graduate students have the opportunity for an informal Q&A panel discussion with women from various graduate and professional schools who will share their experiences and tips for thriving at Duke. This information session is a great chance to learn about graduate life and network with women within and outside of your department. Start off the school year smart!</p> <p><i>Outstanding Woman Leader Awards:</i> The WiSE OWL Awards honor current female graduate students, post-docs and laboratory technicians who have contributed not only to the scientific community through research excellence, but also to the Duke and the Durham communities through exemplary leadership and mentoring. In past years, the awards and ceremony were sponsored by The Office of Graduate Student Affairs, the Pratt School of Engineering, the Office of Postdoctoral Services, and Duke University Stores. A panel composed of graduate students, administrators, post-docs, and faculty members will select the award winners.</p>
Outputs	Professional development workshops, social and networking events, awards
Intended outcomes, effect	Increased number of women faculty members and students in science and engineering, and support for open discussion of science and gender issues.
Evaluation	N/A
Sources/references	http://wise.pratt.duke.edu/about-wise

76. CareerWise (Arizona State University)	
Country/region	US
Level of intervention	Institutional
Who is driving it?	Academia and government
Sector focus	SET
Target group	PhD candidates
Type of initiative	Support and research – professional and personal development of PhD candidates
Description of initiative	<p>The <i>CareerWISE</i> programme is an NSF-funded, interdisciplinary research programme housed at Arizona State University (ASU). The <i>CareerWISE</i> research programme has two major thrusts: 1) the development of an internet-delivered resource with the goal of increasing women's persistence in Science, Technology, Engineering, and Math (STEM) doctoral programs despite challenging circumstances and 2) a research agenda that includes the formal evaluation of the resource's effectiveness and expansion of the resource, along with work striving to characterize the experiences of women who are pursuing and leaving PhD programs in STEM disciplines.</p> <p>The <i>CareerWISE</i> online psychological education programme develops skills for addressing personal and interpersonal challenges in science and engineering environments and for strengthening personal assets and supports. The site is built</p>

	on an extensive foundation of theory and research on psychological processes, environmental context, and personal behaviors that contribute to women's experiences in academic and career paths. The two primary purposes of the site are to help women in STEM programs find ways to better manage their immediate environments (an intervention model) and to provide a long term resource to all women for overcoming barriers and for expanding personal supports in their future career environments. The site characteristics are: customized for women pursuing PhDs in STEM fields; multi-media web based training that includes both written and video content and examples; examples presented in real-life contexts taken from both focus groups and literature; content tested and improved through a series of content evaluations.
Activities	<p>Features of the site includes:</p> <ul style="list-style-type: none"> - Teaches a 4-step, solution-focused problem-solving model that is tailored to augment the problem-solving frameworks already familiar to STEM students and build skills to handle personal and inter-personal problems. - Organized around four key areas of concern reported by women STEM doctoral students: relationships with advisors (Advisors), struggle to manage both academic and personal priorities (Balance), chilly climates in academic departments (Climate), and facing unexpected hurdles during the degree (Delays) - Based on research in psychological and related fields; includes an extensive citation list for interested visitors to learn more - Includes modules on how to understand yourself and how to understand the context of situations - Contains hundreds of HerStory clips from videotaped interviews with women who have successfully navigated the hurdles of graduate school in a variety of STEM fields. Women share their experiences and give advice. <p>The <i>CareerWISE</i> research and development programme has produced nearly 20 publications and presentations at conferences in locations such as the American Educational Research Association, The American Association for the Advancement of Science, the Journal of Women and Minorities in Science and Engineering, the American Society of Engineering Education, and the American Psychological Association.</p>
Outputs	Web-based resource, publications, presentations, research reports
Intended outcomes, effect	Increasing women's persistence in STEM doctoral programs despite challenging circumstances
Evaluation	Effectiveness formally evaluated during 2009/2010 academic year using a randomized clinical trial design based on a national sample. The first of the <i>CareerWISE</i> research efforts involves the formal evaluation of the resource's effectiveness. During the 2009-2010 academic year, a nationwide Random Clinical Trial (RCT) was performed. Results from the trial indicate that when compared to research participants who were not given access to the resource, participants who were given only 5 - 5.5 hours of access to the <i>CareerWISE</i> site showed statistically significant advantages in self-assessed <i>CareerWISE</i> -related competencies, resilience, and confidence. These and other findings from the RCT provide strong evidence of the effectiveness of the resource. Further details on the RCT study and its findings can be found at http://www.asu.edu/careerwise/researchbrief.pdf .
Sources/references	http://careerwise.asu.edu/

77. <i>Scientific career</i> (Stories of and from women in science, engineering, technology and math)	
Country/region	US
Level of intervention	International

Who is driving it?	Industry, academia
Sector focus	SET
Target group	Women in SET
Type of initiative	Online resource – information dissemination, support
Description of initiative	This is a blog carnival that compiles posts written about the broad topic of "women in STEM," and may include posts: stories about being a woman in STEM; exploring gender and STEM academia, living the scientific academic life as well as the rest of life; discussing how race, sexuality, age, nationality and other social categories intersect with the experience of being a woman in STEM; sharing feminist perspectives on science and technology; exploring feminist science and technology studies.
Activities	The carnival is published on or around the 1st of each month. Posts are welcome from women and men and everyone in between if they focus on the topic of the Carnival. In general, hosts have the editorial right to choose what are appropriate or inappropriate posts to include. Hosts of the carnival have the right to delete whatever comments on their blogs that they find to be too offensive or disruptive.
Outputs	Blog pages and comments
Intended outcomes, effect	Support and information sharing for women in SET
Evaluation	N/A
Sources/references	http://scientiae-carnival.blogspot.com/

CANADA

78. Women in Scholarship, Engineering, Science and Technology (WiSEST)	
Country/region	Canada
Level of intervention	National
Who is driving it?	Academia
Sector focus	SET academia
Target group	Women and young girls in all fields of scholarship
Type of initiative	University based organisation: Initiate action to increase the representation of women in all fields of scholarship, retention and promotion
Description of initiative	WiSEST is a University of Alberta-based organisation whose vision is to strengthen science by increasing gender diversity and to enhance choices in science, engineering, scholarship and technology for women of all ages. Our programs foster collaboration and communication with partners in industry, in academia and education, and in governmental and non-governmental organisations in the community. The purpose of WiSEST is to initiate action to increase the representation of women in all fields of scholarship. The studies and actions of WiSEST are concentrated in the under-represented, decision-making fields of science, engineering and technology. Since women are still markedly under-represented in decision-making roles in the sciences and engineering, WiSEST began by investigating why relatively few women choose and remain in careers in the sciences and engineering, and then initiated several on-going programs to

	change the situation. Now, in addition, WISEST is looking at why more women than men leave the sciences and engineering after their first degree and again after about 10 years in the professions. What actions can we take to change these situations?
Activities	<p><i>Research</i> : WISEST is pursuing a variety of research projects that investigate the teaching and promotion of science and engineering for women, the retention of young women in science who are pursuing their studies in regional colleges, and the support and resources needed in women's career transitions.</p> <p><i>UA-WiSE (University of Alberta Women in Science and Engineering)</i>: A student-led learning and support group for young women in science and engineering at the University of Alberta. The group meets monthly during the school term to hold panel discussions and to hear women faculty and professionals in science and engineering areas discuss career and school opportunities.</p> <p><i>Summer Research Program</i>: The WISEST Summer Research Programme provides an opportunity for young men and women who have completed Grade 11 to gain first hand information about different science and engineering disciplines. Participants in the programme will work as paid research assistants on a project in an area that is non-traditional for their gender for six weeks in July and August. The young women will work on research projects in the Faculties of Engineering and Science, and the young men on research projects in the Faculty of Nursing and the Departments of Human Ecology and Nutrition. Participation in this programme will help students to broaden their awareness of career opportunities and will encourage them to consider a future in the research culture.</p> <p><i>SET Conference: Gr 10 – 12</i>: The SET conference happens in the spring every year. During the day you will: Participate in a group challenge; Talk with women from all areas in small groups about their experiences and how they got to where they are today; Participate in some hands-on lab activities; Learn about future opportunities with WISEST By the end of the day, you will have had a chance to Meet other SET participants from other schools who are also interested in science and/or math; Spend the day on campus and talk with university student volunteers and grad students about what life on campus is really like; Learn how unpredictable life in the lab can be and how what you discover can be applied to the 'real' world ; Talk with women who are in SET careers, who can give you advice on how to manage your time, be successful and still have a social life.</p> <p><i>Parent Information Session</i>: During the day of the conference we will also have a Parent Information Session for parents/guardians, teachers and guidance counselors. This session provides a great opportunity for parents to meet with Science and Engineering Faculty representatives to discuss the University of Alberta.</p> <p><i>Choices Conference - Gr 6 Girls</i>: The <i>Choices</i> conference is an exciting opportunity to involve grade six girls and their teachers in hands-on experiences in the fields of science and engineering at the University of Alberta. The objectives of this day are to: Help young women to see that science is something they can do and that it is fun; To challenge students' ideas about engineers and scientists; Promote the idea that science and engineering are human experiences filled with creativity and wonder. Each girl, with her teacher and three other girls from her school, is invited to take part in working teams and laboratory activities that show the principles of physics, engineering, chemistry and biology in action. The day's activities include working in small groups, where they are challenged to build something of their own</p>

	design, such as a bridge or a catapult. The girls also try out two hands-on lab activities that give them a glimpse of what it would be like to be a scientist or an engineer. After this day of experimentation and learning, students and teachers go back to their classrooms to share their experiences, spilling the enthusiasm generated at the conference over to all the students. The interest created by this day can be seen in the positive http://www.uofaweb.ualberta.ca/wisest/nav02.cfm?nav02=21927&nav01=21325 comments of students and their teachers collected in the post-conference evaluation.
Outputs	<ul style="list-style-type: none"> - Research reports providing insight into the teaching and promotion of science and engineering for women, the retention of young women in science, and the support and resources needed in women's career transitions. - Support groups - Summer research program - SET Conference days
Intended outcomes, effect	<ul style="list-style-type: none"> - Increase in gender diversity in science – increased representation of women in all fields of scholarship - Enhanced choices in science, engineering, scholarship and technology for women of all ages - Promotion of careers in SET
Evaluation	N/A
Sources/references	http://www.wisest.ualberta.ca/

79. Canadian Coalition of Women in Engineering, Science and Technology (CCWEST)	
Country/region	Canada
Level of intervention	National implementation level
Who is driving it?	Industry
Sector focus	SET general
Target group	Women in SET in Canada
Type of initiative	Web-based resource
Description of initiative	<p>CCWESTT is a national coalition of groups that aims to promote women in science, engineering, trades and technology, celebrate their contribution and apply new vision to these fields. It has member organisations including Alberta Womens Science Network, The NSERC Nortel Joint Chair for Women in Science and Engineering in Ontario, and the Women in Engineering Advisory Committee (WEAC)-Manitoba. CCWEST brings together a range of Canadian sites for women in SET in a pool of web-based resources and links. Objectives are:</p> <ul style="list-style-type: none"> - To develop and maintain a resource and support network to facilitate the exchange of information amongst member organisations. - To promote and advocate for the full participation of women in science, engineering, trades and technology in government, business, industry, and education. - To research, measure, evaluate and disseminate information on the integration of women in science, engineering, trades and technology at all levels. <p>Established in 1987 CCWESTT currently represents more than 20,000 individuals through 25 organisations whose mandates and interests are to promote gender equity in science, engineering, trades and technology.</p> <p><i>Women in SETT (Science, Engineering, Trades and Technology):</i> In 2003, CCWESTT began the Women in SETT/Femmes en SGMT Initiative to strengthen policy and practice to increase women's recruitment, retention and advancement in</p>

	<p>science, engineering, trades and technology in institutions and across sectors throughout Canada. Achieving this mission will strengthen Canada's economy by capitalizing on our full human resource potential, providing solutions to skills shortages, and increasing innovation capacity and global competitiveness.</p> <p>Primary work in Phase I included input on important issues from CCWESTT members, consultations with stakeholders and institutional leaders, research, and building relationships with the assistance of eminent advisors. In Phase II, at the CCWESTT National Conference in Calgary in June 2006, we presented the strong business case for increasing women in SETT, and proposed a model for a Canadian Policy and Resource Centre for Women in SETT. CCWESTT completed Phase I on Oct. 31, 2004. There was significant support and momentum created during that process and outcomes included:</p> <ul style="list-style-type: none"> - Significant engagement of organisations and individuals who share an interest and mandate in increasing women's participation and retention in SETT fields; - Establishment of national and regional networks, collaborations and partnerships with the support and encouragement of key stakeholders; - Comprehensive Regional Consultations (3) and National Meetings (4) held between November 2003 and November 2004; - Collective identification of priorities, barriers and core issues related to women's participation and retention in SETT fields, including gaps in data and policy; - Ongoing identification, documentation and dissemination of best practices; - Distribution of a Final Project Report documenting information collected to participants and stakeholders; - Delivery of the first in a series of 'domain' papers with specific recommendations for selected audiences. <i>Women in SETT: Human Resources to Build Canada's Economy</i> was presented to Canada's National Science Advisor and other decisionmakers in the Federal government at a roundtable Nov. 4, 2004. <p>Phase II : There is recognition that the work and accomplishments of Phase I were the first steps in a longer process of effecting institutional and public policy change to significantly increase the participation and leadership of women in SETT careers and sectors. The key goal for Phase II is to expand and mobilize partnerships to define a model and identify support for a national Women in SETT / Femmes en SGMT entity that will advise government, industry, sector councils, post-secondary institutes and professional organisations; track and analyze data and research; review and advise on policy; disseminate effective practices; and promote action. Phase II Objectives:</p> <ul style="list-style-type: none"> o Research and assess existing models of other institutionalized national 'bodies/councils' that promote women in SETT and provide advice to governments, industry, and educational institutions. o Consult with women in SETT organisations, other stakeholders and institutions to integrate perspectives and priorities, and gain support in developing an effective Canadian model. o Develop a business case for its creation and use to raise awareness and support. o Present model(s) and recommendations at a national meeting of stakeholders coincident with the CCWESTT National Conference in Calgary, June 22-25, 2006. o Identify partners and potential support for the next phase of operationalizing the Women and SETT 'body/process'. <p>Phase III: In March 2007, CCWESTT was pleased to again receive significant 18-month funding from the Women's Programme of Status of Women Canada to</p>
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	<p>advance the WinSETT initiative. Specifically, the focus of Phase III is to develop, deliver and evaluate recruitment and retention products and services for organisational partners addressing skills shortages in four designated sectors namely Oil and Gas, Post-Secondary Education, Construction and Trades and Information Technology.</p> <p>Preliminary resources are already in development, including a <i>Checklist of Strategies to Welcome Women into SETT Workplaces</i>. Pilot workshops and activities have been identified for the four sectors, partners are being engaged, and these services will be delivered in various locations across Canada in the fall of 2007 and in 2008. The WinSETT initiative will communicate and promote these models and resources to industry, education and training institutions, professional and sectoral organisations, and women in SETT, through a new web portal being developed. Providing strategic guidance to assist the Working Committee, help promote WinSETT and leverage our influence, is an Advisory Panel of high level leaders in key stakeholder organisations. Support from CCWESTT member organisations and other external partners continues to strengthen our efforts.</p>
Activities	<p>The CCWEST web site aims to facilitate communications amongst the member organisations -- and outwards to anyone interested in the organisation's goals.</p> <p>Networking, information-sharing, mentoring</p> <p>The web site contains the following: Latest news, Search engines, A database, Employment opportunities, Links, Abstracts and papers, Statistics, Upcoming events</p>
Outputs	Mentoring, information sharing, search engines, database, employment links, research reports, statistics
Intended outcomes, effect	<ul style="list-style-type: none"> - Awareness of women in science, engineering, trades and technology and their contribution - A pool of web-based resources and links that encourages networking, support and information sharing between members - Research about the integration of women in science, engineering, trades and technology at all levels
Evaluation	Evaluation reports available online
Sources/references	http://www.ccwestt.org/

80. Society for Canadian Women in Science and Technology (SCWIST)	
Country/region	Canada
Level of intervention	National Policy and implementation
Who is driving it?	Industry and academia
Sector focus	Science and technology
Target group	Canadian women in SET
Type of initiative	Non-profit organisation/Society: Support, awareness, capacity development
Description of initiative	<p>The Society's programmes aim to support, promote and build the capacity of women in SET. SCWIST is a non-profit voluntary association, established in 1981. SCWIST's mission is to promote and empower women in science and technology. As such, SCWIST provides opportunities to women to put their talents to use or to develop new skills. These include grant writing, science journalism, photography, electronic communication and web design, policy analysis, fundraising, public relations, mentoring, public speaking and science outreach for girls. Mission:</p> <ul style="list-style-type: none"> - To promote public awareness of the opportunities for women in

	<p>science and technology by providing information and resources which aim to influence public policy and present positive messages about women's achievements and potential in this area</p> <ul style="list-style-type: none"> - To encourage the full participation of girls and women in all aspects of science and technology education, through the provision of programs and activities which are developed and implemented in partnership with relevant community members - To increase the representation, retention and status of women in the science and technology workplace by providing networking and mentoring opportunities and advocating for women-friendly workplaces and education policies.
Activities	<p>In addition to its Resource Centre, SCWIST runs two signature programs namely <i>ms.infinity programme</i> and <i>Immigrating Women in Science (IWIS)</i>.</p> <p><i>Ms.infinity</i> runs across the province of BC and the Yukon expose young women to interesting and exciting career options and positive female role models who are pursuing dynamic careers and education in science and technology. <i>ms. infinity</i> attempts to defy stereotypes of science careers and women scientists. The programme further includes:</p> <ul style="list-style-type: none"> - <i>ms infinity Conferences:</i> The <i>ms infinity</i> conferences attempt to encourage young women in grades 9 and 10 to continue studying math and science throughout high school to broaden their career possibilities. Most commonly held over one day, the conferences include hands-on workshops led by women currently working in the field of science and technology, a motivating keynote speaker and a careers game. Most communities personalise the conference to address the needs of their students. <i>ms infinity</i> conferences can be held at any time of the year. Some communities have found that hosting them in May allows them to use the facilities at local universities or colleges. If you would like to feature a hands-on workshop, the Explore Science Careers Game or a keynote speaker at your upcoming event, please let us know and we will help you customize a program. The <i>ms infinity</i> committee works in cooperation with other community organisations, schools and colleges in British Columbia, Canada to deliver the conferences. Local input is sought for the development of the agenda and whenever possible local resource persons and role models participate in the workshops and lectures. SCWIST offers a list of Lower Mainland role models and covers travel and accommodation costs for up to two speakers to remote areas. - <i>Science Day:</i> Science Day is <i>ms infinity</i>'s newest program. These events help Brownie, Guides and Pathfinders earn their Scientist, Engineering or Computer Science Badges. - <i>Telementoring:</i> This electronic programme is designed to facilitate an on-going guiding relationship between students and mentors – an opportunity for professional women to act as role models for young students. With 30-45 minutes/week of e-mail communication, professional women can encourage young women to discover the excitement and rewards of careers in math, science and technology, broaden their horizons, help them improve their communication skills and provide them with a forum for their questions and concerns. <p><i>The Immigrating Women in Science Project (IWIS)</i> is for you if you are looking for a network of women, both locally and internationally trained, who are currently working in science, engineering and technology. Its aim is to support immigrating professional women in science, engineering and technology. IWIS offers services such as mentorship, resource centre and newsletter. These are designed to help internationally trained women with the challenges and barriers they face in starting and building their careers in Canada. The mission of the IWIS project is:</p> <ul style="list-style-type: none"> - To increase discussion about the issues faced by immigrating professional women in SET careers, including the barriers to starting and advancing careers - To help women access meaningful work that is appropriate for their education and work experience from their home countries

	<ul style="list-style-type: none"> - To help women access academic and professional training information as well as education and retraining options - To create a network of women in SET careers that includes women who are locally and internationally trained in order to provide mentorship and collective support.
Outputs	<ul style="list-style-type: none"> - Conferences encouraging young women to continue studying maths and science - Science days - Telementoring role model and mentoring programme - Networking with local and international women working in SET - Resource centre - Newsletter
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased support and awareness of women and their achievement and opportunities in SET - Increased capacity of women in SET - Increased participation of girls and women in all aspects of S&T education - Increased representation, retention and status of women in S&T
Evaluation	N/A
Sources/references	http://www.scwist.ca/

81. The Computer Research Association's Committee on the Status of Women in Computing Research (CRA-W)	
Country/region	Canada
Level of intervention	National
Who is driving it?	NRF plus additional funding: Public plus academia
Sector focus	Computer science and computer engineering
Target group	Women participating in computer science and engineering research and education at all levels
Type of initiative	Committee: Increasing the number of women participating in computer science and engineering research and education at all levels, increase degree of success, provide forum for addressing problems.
Description of initiative	The Computer Research Association's Committee on the Status of Women in Computing Research (CRA-W) is an action-oriented organisation dedicated to increasing the number of women participating in Computer Science and Engineering (CSE) research and education at all levels. In addition to increasing the number of women involved, we also seek to increase the degree of success they experience and to provide a forum for addressing problems that often fall disproportionately within women's domain. We are hopeful that the committee activities will also have a positive impact for other underrepresented groups in CSE and we are committed to improving the working environment for Computer Scientists and Engineers of both genders.

Activities	<p>Community Building: Fostering professional networking, collaboration, and recognition of women in computing. Initiatives include:</p> <ul style="list-style-type: none"> - <i>Anita Borg Early Career Award:</i> This award will be given to a woman in computer science and/or engineering who has made significant research contributions and who has contributed to her profession, especially in the outreach to women. - <i>Award Nominations:</i> Increases the visibility of women's contributions in CSE by encouraging nominations for professional awards and recognition. - <i>Cohort of Associate Professors Project (CAPP):</i> Aims to increase the percentage of CS&E women faculty with the rank of full professor by forming and mentoring a cohort of women from the associate professor ranks. - <i>Distinguished Lecture Series:</i> Recruits students into graduate programs through technical talks and presentations by visiting teams of researchers and graduate students. - <i>ResearchHers:</i> A private forum and database system for women in computer science research to discuss issues relating to themselves as women and computer science researchers. - <i>Systers Academia:</i> More than 500 women are part of this moderated mailing list for graduate students and faculty women in CSE. <p>Research mentoring: Providing hands-on research experiences and mentoring programs that guide, support, and encourage women in computing. Initiatives include:</p> <ul style="list-style-type: none"> - <i>Best Practices in Recruiting and Retaining Women in Computer Science and Engineering (CSE):</i> Documents effective strategies to increase the participation of women in graduate programs - <i>Career Mentoring Workshops:</i> Brings graduate students and new Ph.D.s together with senior researchers to develop career strategies. - <i>Collaborative Research Experiences for Undergraduates (CREU):</i> Gives undergraduates opportunities to work on collaborative research projects. - <i>Distributed Mentoring Project (DMP):</i> Pairs undergraduate women with women research mentors for summer research. - <i>Canadian Distributed Mentoring Project:</i> Pairs undergraduate Canadian women with female professors for a summer of research and mentoring. The project is a program to encourage undergraduate women in computer science and computer engineering to go to graduate school. - <i>Grad Cohort for Women:</i> Builds and mentors a nationwide community of women through their graduate studies. - <i>Discipline-specific Mentoring Workshops:</i> Increases participation of members of underrepresented groups within a specific research area by providing career mentoring advice - <i>Multidisciplinary Research Opportunities for Women (MRO-W):</i> Involves undergraduate students in collaborative, multidisciplinary research creating and using cyber infrastructure. <p>Information Sharing: Collecting, analyzing, and disseminating information about and for women in computing. Initiatives include:</p> <ul style="list-style-type: none"> - <i>Books:</i> A list of computer science books by women computer scientists. - <i>Careers Booklet/Website:</i> Profiles the lives of women with exciting and challenging CSE careers. - <i>"Expanding the Pipeline":</i> Reports on projects and issues relevant to underrepresented groups through a regular column in CRA's Computing News.:
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	- Presentations at Conferences
Outputs	Networking, professional awards, cohort of associate professors, distinguished lecture series, database system, mailing list, hands-on research experience, mentoring, best practices in recruiting and retaining women in CSE, books, career booklet, website.
Intended outcomes, effect	<ul style="list-style-type: none"> - Increasing the number of women participating in computer science and engineering research and education at all levels - Increase degree of success of women in CSE - Provide forum for addressing problems experienced by women working in CSE
Evaluation	N/A
Sources/references	http://www.cra-w.org/

82. The Women in Engineering Programs & Advocates Network (WEPAN)	
Country/region	Canada
Level of intervention	National & across institutions
Who is driving it?	Academia and industry
Sector focus	Engineering
Target group	Women in engineering in Canada
Type of initiative	NPO: Academic and professional development for aspiring engineers by transforming environments in institutions of HE
Description of initiative	<p>WEPAN is a national not-for-profit organisation with over 600 members from nearly 200 engineering schools, small businesses to Fortune 500 corporations, and non-profit organisations. WEPAN is dedicated to improving the climate for and success of all women in engineering. By transforming environments in institutions of higher education, a diverse population of aspiring engineers can succeed. WEPAN began in 1990 as a collaboration of leaders at several major universities who were focused on supporting women in engineering fields of study. Since that time, membership has grown to include a variety of institutions of higher learning, including large research institutions, smaller technical or liberal arts colleges, and community colleges. Members also represent corporations, government agencies and other not-for-profit organisations that are focused on the full participation of women in engineering.</p> <p><i>Vision:</i> To achieve the full participation of women in engineering.</p>

	<p><i>Mission:</i> WEPAN's mission is to be a catalyst, advocate, and leading resource for institutional and national change that enables the success of all women in engineering.</p> <p><i>Overall Strategy:</i> WEPAN's strategy is to focus on higher educational institutional transformation. WEPAN will leverage its information, experience, partnerships, and advocacy to bring about change on an institutional and national level focusing on colleges of engineering and Science, Technology, Engineering, and Mathematics (STEM) related disciplines. WEPAN will continue to be the leading resource and advocate for women in engineering by providing information, trends, and best practices to all interested in advancing women in STEM fields.</p>
Activities	<p><i>WEPAN Awards</i> honor key individuals, programs, and corporations for accomplishments that underscore WEPAN's mission. They are presented each year at the annual conference for extraordinary service, significant achievement, model programs, and work environments that support the career success of women engineers.</p> <p><i>The Founders Award</i> honors a WEPAN member who exemplifies the spirit of the WEPAN founders through her/his extraordinary long-term service to the organisation. As this award is reserved for individuals who have truly advanced the goals of the organisation, it may not be awarded every year. Individuals may only receive this award once. This award includes a plaque and an opportunity to serve as a keynote speaker at the next WEPAN national conference.</p> <p><i>The Distinguished Service Award</i> recognizes a WEPAN member whose individual service has made a significant impact for the organisation. Nominations are made by WEPAN members. Committee chairs are encouraged to submit nominations. One award made annually. Individuals may only receive this award once. The award includes a plaque.</p> <p><i>The Betty Vetter Award for Research</i> recognizes notable achievement in research related to women in engineering. One award will be given annually. Individuals are only eligible to receive this award once. This award includes a plaque and an opportunity to serve on an experts' panel at the next WEPAN national conference.</p> <p><i>The Women in Engineering Initiative (WIEI) Award</i> recognizes an outstanding programme or project that serves as a model for other institutions. To be considered, programs and projects should be established (i.e., in existence for 5 or more years) and have assessment data included in the nomination. Assessment data should include pre/post data or long-term tracking to indicate how the programme has made an impact. One award will be given annually. Institutions are limited to one award in a three-year period. This award includes a plaque and an opportunity to speak on an experts' panel at the next WEPAN national conference.</p> <p><i>The Breakthrough Award</i> recognizes and honors an employer for creating a work environment that enhances the career success of women engineers of all ethnicities. The name of the award signifies the ability of an employer to "break through" the artificial barriers that prevent women engineers of all ethnicities from</p>

	<p>attaining their full potential. Recipients are announced in the national media and in all WEPAN publications and web sites.</p> <p><i>The University Change Agent Award</i> recognizes and honors an individual who has driven positive change at their institution with regard to the climate for women in STEM (Science, Technology, Engineering and Mathematics) fields, with an emphasis on engineering. Nominations for this award will be sought through the Dean's Council, University Presidents, University Commission on the Status of Women (and like organisations), and WEPAN members. Recipients are announced in the national media and in all WEPAN publications and websites. This award includes a plaque and an opportunity to speak on an experts' panel at the next WEPAN national conference.</p>
Outputs	Data and statistics on engineering enrollments and degrees, conference papers, links to women in engineering activities on campus, slide portfolio of current presentation slides aimed at increasing awareness and generating support for programs and activities that enhance the success of women in STEM fields, various awards.
Intended outcomes, effect	<ul style="list-style-type: none"> - Improved climate and success of all women in engineering by transforming environments in institutions of HE - Increased participation of women in engineering
Evaluation	N/A
Sources/references	http://www.wepan.org

83. The Chairs on Women in Engineering in Universities (CWSE)	
Country/region	Canada
Level of intervention	National, institutional
Who is driving it?	Public service: The National Science and Engineering Research Council and academia
Sector focus	Science and Engineering
Target group	Women in S&E: students and professionals
Type of initiative	Chair programme: Increase the participation of women in S&E, provide role models for women active in and considering careers in S&E
Description of initiative	<p>The goal of the programme is to increase the participation of women in science and engineering and to provide role models for women active in and considering careers in these fields.</p> <p><i>Objectives of the program:</i></p> <ul style="list-style-type: none"> - Develop, implement, and communicate strategies to raise the level of participation of women in science and engineering as students and as professionals, specifically to: <ul style="list-style-type: none"> o encourage female students in elementary and secondary schools to consider careers in science and engineering; o increase the enrolment of women in undergraduate and graduate programs in science and engineering in all Canadian universities and colleges; o increase the profile and retention rate of women in science and engineering positions; o eliminate barriers for women who wish to pursue careers in science and engineering; and o promote the integration of female students and professionals both

	<p>within and outside academia.</p> <ul style="list-style-type: none"> - Provide female role models who are accomplished, successful, and recognized researchers in science and engineering. - Develop and implement a communication and networking strategy to ensure a regional and national impact on opportunities for women in science and engineering.
Activities	Joint funding for chair positions
Outputs	Chairs at HE institutions
Intended outcomes, effect	<ul style="list-style-type: none"> - Raise the level of participation of women in science and engineering as students and as professionals - Increase the enrolment of women in undergraduate and graduate programs in science and engineering - Increase the profile and retention rate of women in science and engineering positions; - Address barriers for women who wish to pursue careers in science and engineering; and - Provide female role models who are accomplished, successful, and recognized researchers in science and engineering
Evaluation	N/A
Sources/references	http://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/CWSE-CFSG_eng.asp

84. University Faculty Awards (UFA)	
Country/region	Canada
Level of intervention	National
Who is driving it?	Public service: National Science and Engineering Research Council (NSERC), Canada
Sector focus	Science and engineering
Target group	Women in natural sciences and engineering in Canadian universities
Type of initiative	Government programme: Representation, participation
Description of initiative	<p>The goal of the UFA programme is to decrease the under-representation of women and Aboriginal peoples in faculty positions in the natural sciences and engineering by encouraging Canadian universities to appoint very promising researchers in those groups to tenure-track or tenured positions in science and engineering. Amongst other criteria, the applicant must be a woman or Aboriginal person who holds a doctorate in one of the fields of research that NSERC supports; or expect to have completed all the requirements for such a degree, including your thesis defense, by the proposed date of appointment.</p> <p>This funding programme targets women and Aboriginals in Canada. The Awards secure the recipients with up to five years of salary support at a minimum level of Assistant Professor, with a guaranteed research grant. The Awards are only available to individuals at Canadian universities.</p>
Activities	Funding award
Outputs	Research grants
Intended outcomes, effect	A decrease in the under-representation of women and Aboriginal peoples in faculty positions in the natural sciences and engineering.

Evaluation	N/A
Sources/references	http://www.nserc-crsng.gc.ca/Professors-Professeurs/CFS-PCP/UFA-APU_eng.asp

AFRICA

85. The Female Education in Mathematics and Science in Africa (FEMSA)	
Country/region	Africa
Level of intervention	FEMSA aims at improving the participation and performance of girls in Science, Mathematics and Technical (SMT) subjects at the primary and secondary school levels.
Who is driving it?	Academia and industry: A project of the Association for the Development of Education in Africa (ADEA) Working Group on Female Participation and is hosted by the Forum for African Women Educationalists (FAWE) Activities are funded by a consortium of Donors headed by NORAD.
Sector focus	Science, Mathematics and Technical
Target group	Girls at primary and secondary school level
Type of initiative	Research study
Description of initiative	FEMSA aims to promote the involvement of girls in science, mathematics and technology subjects at primary and secondary schools in Africa.
Activities	<p>FEMSA completed a two-year pilot phase in December, 1997. The major objective of the pilot phase was to compile Country Profiles of four countries, Cameroon, Ghana, Tanzania and Uganda, by making use of a partnership of students, teachers and parents to explore the problems girls face in the study of SMT subjects. These Country Profiles provide an information base on the status of girls' access to the study of SMT subjects and the constraints and difficulties they face in learning these disciplines. They further give an insight into the reasons for these difficulties, the attitudes of the girls themselves to the study of SMT subjects and those of their fellow male students, their teachers and parents, and offer some solutions which may be of use in improving the girls' performance.</p> <p><i>Objectives of the Country Profiles:</i></p> <ul style="list-style-type: none"> - To document and compile an information base on the status of SMT education with special reference to the access and performance of girls - To sensitise relevant ministries of education and other key persons in education about the status of female participation in SMT and the importance of reforming SMT education to meet the needs of girls - To provide information on innovative interventions in these areas by both formal government departments and agencies and NGOs, donors and the informal sector - To document past and ongoing research in the areas of SMT and gender issues and indicate areas where research is needed - To disseminate and share information and experiences on girls' education at national and regional levels - To draw out differences, similarities and lessons to be learned from the experiences in the four countries - To facilitate, through national seminars and follow-up activities, the initiation of concrete and appropriate national strategies, action programmes and interventions based on the compiled data and shared experiences. <p>A further important objective of the pilot phase was to sensitize ministries of education and other key persons in education about the status of girls' participation and performance in SMT and the importance of reforming SMT education to meet</p>

	<p>the needs of girls. This was done through the holding of National Seminars and through the design of National Action Plans in each of the pilot phase countries. Through the National Seminars, FEMSA has succeeded in building in each country a budding partnership of students, teachers and parents on the one hand, and policy and decision makers, gender activists, NGOs and funding agencies on the other, to begin to take action to improve the participation and performance of girls in SMT subjects. The problem is complex and pervades all sectors of the education system and the wider community. It is only through building a strong partnership of all the players involved, and providing precise information on the nature of the problem and the reasons leading to girls' current attitudes, that the situation can be alleviated.</p> <p>Thus, from the beginning, the FEMSA methodology and research instruments were based on the following principles:</p> <ul style="list-style-type: none"> - To allow reasonable freedom to each country to adapt the approach, methodology and instruments to suit their own unique circumstances - To build the Country Profiles around the views and perceptions of those most intimately affected by the problem: the girl students, their fellow male students, their teachers and their parents - To attempt to put a human face on the quantitative data available in each country by placing the main emphasis on collecting qualitative and ethnographic data - To gather data on the reasons for the problems and elicit possible solutions from teachers, students and their parents - To set the Country Profiles in the context of the overall educational structure and policy regarding the education of girls. <p>In each country the National Teams concentrated on gathering data on a number of key areas:</p> <ul style="list-style-type: none"> - The relevance of the current syllabuses in SMT subjects to the needs of girls and women in their lives after school - The attitudes of girl students, teachers and parents to the study by girls of SMT subjects in school and to girls pursuing careers in the sciences and technology - How SMT subjects are presented in class, with special reference to how girls are treated in SMT classes - The extent to which gender issues are addressed in the design and production of curriculum support materials and the involvement of women in the curriculum development process - The gender sensitivity of examinations, the performance of girls relevant to that of boys in mathematics and science and the reasons for poor performance by girls in these subjects. <p>It was decided that in each country the compilation of the Country Profiles should centre round a small sample of primary and secondary schools and that an in-depth study should be carried out in each school to build up a complete profile of the school with regard to the following areas:</p> <ul style="list-style-type: none"> - The physical facilities available and the resources to be had in the school for the teaching and learning of Mathematics and Science - The gender composition and qualifications of the staff - The attitudes of the students to the importance of Mathematics and Science in their lives after school
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	<ul style="list-style-type: none"> - The perceptions of the students, teachers and parents of the difficulties and constraints faced by girls in the learning of mathematics and science and the reasons for these - The views of students, teachers and girls regarding any differences in performance in these subjects between boys and girls and the reasons for any reasons revealed - Views of students, teachers and girls on how the teaching and learning of Mathematics and Science could be improved and made more relevant for girls - The methods and approaches used in primary school Mathematics and Science lessons, the overall treatment of girls in comparison to that received by boys, and the willingness or otherwise of teachers to motivate the girls in Mathematics and Science on an equal basis with boys. It was decided not to undertake classroom observations in secondary schools, as it was believed that in many, the approaches were similar to those used in primary schools.
Outputs	FEMSA has published a series of booklets in order to share the experiences and information gained in the pilot phase with educationalists who cherish the goal of making SMT subjects more easily accessible to girls and of increasing girls interest and performance in these disciplines, and in the interests of helping to build strong partnerships among all relevant players to achieve this goal.
Intended outcomes, effect	<ul style="list-style-type: none"> - Insight into the difficulties girls face in the study of SMT subjects in Cameroon, Ghana, Tanzania and Uganda - To sensitise relevant ministries of education and other key persons in education about the status of female participation in SMT and the importance of reforming SMT education to meet the needs of girls - To provide information on innovative interventions in these areas by both formal government departments and agencies and NGOs, donors and the informal sector - To document past and ongoing research in the areas of SMT and gender issues and indicate areas where research is needed - To disseminate and share information and experiences on girls' education at national and regional levels.
Evaluation	Evaluation of Phase 1 available online
Sources/references	http://www.unesco.org/education/educprog/stp/projects/girls%20africa/femsa/femsa.html

86. African Women in Engineering and Science	
Country/region	Africa
Level of intervention	Regional
Who is driving it?	Academia, industry and public service: Global Alliance for Diversifying the Science and Engineering Workforce
Sector focus	Science, mathematics, engineering and technology
Target group	Women (students and working) in SMET in African countries (pilot in Egypt, Mali and Nigeria)
Type of initiative	Project – pilot study Participation – students and working
Description of initiative	This project is a pilot study to promote the participation of women students and professionals in science and engineering in Egypt, Mali and Nigeria. The project will begin in these three countries and expand to other African nations. The Global Alliance, through the University of Washington, received a \$175,000 grant

	<p>beginning January 2001 from the Engineering Information Foundation. The grant was awarded for a proposal to conduct a pilot study to promote the participation of women students and professionals in science and engineering in Egypt, Mali, and Nigeria. The project will begin in these three countries and expand to other African nations. The proposal is a collaborative partnership between the University of Washington and AAAS (American Association for the Advancement of Science).</p> <p>The proposal entails a two-year project to build on the Global Alliance's existing networks and comprehensive web site by establishing collaborations with top engineering universities and professional associations in Africa and to increase awareness and participation of women in SMET (Science, Mathematics, Engineering and Technology).</p>
Activities	Science promotion, networking, information-sharing
Outputs	<p>Pilot study report</p> <p>Collaboration - partnerships and information exchange with top engineering universities and professional associations in Africa</p> <p>Meeting reports:</p> <ul style="list-style-type: none"> * Final Report of the "Building and Sustaining Infrastructure for Gender-Empowered Partnerships in the Technological fields" conference (IGEPT 2000) in Stockholm, Sweden on 21-30 August 2000. The goals of IGEPT 2000 were to discuss gender perspectives and women action programs in the engineering and technical fields; entrepreneurship, partnership and leadership; and, technology and engineering. Representatives from major corporations, government, academia in both the US and Sweden attended. * Papers presented at the Forum on Women in Science and Technology, organized by the Global Alliance at the Beijing +5 Women's Conference, June 2000, New York. * Final Report of the "Women in Engineering and Science" at the World Engineers Convention in Hannover, Germany, 19-21 June 2000. This event focused on strategies and best practices for recruitment and retention in science and engineering in higher education institutions and advancement of women scientists and engineers in the workplace. * Final Report of the "Women & Minorities in Trade & Technology Forum" in Seattle, WA on October 16, 1999, which featured prominent women and minorities in industry, government, and academia. They discuss challenges they face in achieving success in their fields. This event was hosted in collaboration with the Seattle Host Organisation for the World Trade Organisation Ministerial Conference in 1999.
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased awareness of women in SMET - Increased participation of women students and professionals in science and engineering in Egypt, Mali and Nigeria. - Website that offers collaboration with top engineering universities and professional associations in Africa
Evaluation	Only initial information as presente don website – no further trace after pilot.

Sources/references	http://www.globalalliancesmet.org/africa.htm
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KENYA

87. Kiriri Women's University of Science and Technology	
Country/region	Kenya
Level of intervention	National, institutional
Who is driving it?	Public service and academia
Sector focus	S&T general
Target group	Women interested in undertaking SET programmes at university level
Type of initiative	Higher education institution: Awareness, access, participation – HE specifically
Description of initiative	<p>The Kiriri Women's University of Science and Technology (KWUST) is a non-state funded secular women's university operating under authority from the Government of Kenya, the only one of its kind in Eastern and Southern Africa. The university seeks to expand opportunities for higher education in the scientific and technological fields to women in Kenya and the rest of the world in an environment that will promote the full and holistic development of the individual as a responsible member of the community through academic pursuit and the promotion of self-discipline. Our mission is to educate and train individuals in the search for truth and knowledge through scientific methods. The KWUST graduates will be expected to have acquired unique qualities for leadership and scientific enterprise. They should not only excel in the sciences but also possess the ability to apply their knowledge to practical problems and issues in their societies. Product Research and Development Centres are being established as real-life environments to which the academic staff and students can relate. The graduates from the university are then able to adapt to practical issues before they enter the work scene. Degree Programmes on offer: Bachelor of Science (BSc) in Computer Science, Bachelor of Science (BSc) in Mathematics, Bachelor of Science in Computer Science. Students at KWUST undergo a vigorous programme of education and training covering theoretical, practical and work-based experience through practical attachments.</p>
Activities	Education and training
Outputs	Degree courses Qualified and highly skilled graduates
Intended outcomes, effect	<ul style="list-style-type: none"> - Expanded opportunities for higher education, in the scientific and technological fields to women in Kenya and the rest of the world - Graduates with unique qualities for leadership and scientific enterprise, able to apply their knowledge to practical problems and issues in their societies.
Evaluation	N/A
Sources/references	http://www.kwust.ac.ke

UGANDA

88. Department of Women and Gender Studies Makerere University	
Country/region	Uganda
Level of intervention	National, institutional
Who is driving it?	Academia
Sector focus	S&T
Target group	Women and men in Uganda
Type of initiative	University department: Gender mainstreaming – access and participation
Description of initiative	<p>The Department has a clear focus on gender mainstreaming, especially with regard to gender, science and technology. The Department of Women and Gender Studies (DWGS), Faculty of Social Sciences, is a multidisciplinary academic unit. The Department, the first of its kind in sub-Saharan Africa, was established in 1991, out of the realization that gender is a necessary and an integral part of the development process. The Department is at the forefront of academic and community initiatives to address gender and development from an African perspective.</p> <p>DWGS has established itself as a leading training institute for women and men. DWGS seeks to contribute to the development in Uganda through ensuring that gender is an integral part of the development process. This involves among others, providing the intellectual leadership for mainstreaming gender in the aspect of Technology, within the university and beyond.</p> <p>Mission: Provide intellectual leadership for mainstreaming gender in all aspects of economic, political and social – cultural development.</p> <p>Objectives:</p> <ul style="list-style-type: none"> - To train a cadre of various backgrounds who will serve in government, academic and non governmental organisations, where they will act as catalysts for change and will facilitate the integration of gender in decision-making and policy formation - To contribute to the intellectual development of the study of gender and development from an interdisciplinary perspective through undertaking research and updating the University curricula to incorporate the results of new scholarship - To make both men and women aware and helping them to understand, recognize and acknowledge the multidimensional roles of women and men in society through public lectures, seminars, workshops and the mass media - To contribute to the knowledge base regarding gender issues in Uganda in particular and Africa as a whole - To contribute to the national and global debate on gender by linking scholars, policy makers, activists, extension and field workers for the promotion of women in development activities and programmes. <p>In executing its mandate the DWGS works through a comprehensive strategy that includes teaching and training; research publication and dissemination; outreach; networking, advocacy and gender mainstreaming.</p>
Activities	Teaching, training, research, outreach, networking, advocacy

	<p>Courses:</p> <ul style="list-style-type: none"> - <i>Bachelor of Arts Programme:</i> The Department offers Gender and Development (GAD) subjects for undergraduates undertaking courses in the Social Sciences and Arts. The GAD courses that commenced in 1999 are taken by students alongside other social science or arts disciplines. - <i>Master of Arts (Gender Studies):</i> This is an 18 months graduate course with four semesters (October to February and March to July). The degree is assessed by course work and research. - <i>Doctoral programme (PhD):</i> Owing to continued demand, the Department of Women and Gender Studies with effect from the year 2000 started offering a PhD programme by research only. The target has been students with Women and Gender studies background. - <i>Post graduate diploma in gender studies:</i> To develop analytical skills for mainstreaming gender in policies, plans, legislature and budgets. - <i>Outreach programmes:</i> Under the outreach programme, the Department of Women and Gender Studies offers a number of short or tailor made courses to the local and international community which includes the following: <ul style="list-style-type: none"> - <i>Gender training and awareness creation:</i> The Department of Women and Gender Studies conducts a number of awareness and gender training programmes for the University community, in Uganda and Internationally. The Department has trained University students outside the Department, University academic and non academic staff, NGOs, Government officials in Uganda and outside and continues to play a leading role in gender mainstreaming related training. - <i>Short Evening courses:</i> Short evening courses run for a period of five weeks and are open to people with a Uganda Advanced Level Certificate or its equivalent. The courses, which have run since May 1996, have been attended by more than 300 people including decision makers, trainers, managers in public, private and NGO sectors. - <i>Gender and ICT courses:</i> The Department of Women and Gender Studies conducts selected courses in ICT aimed at reducing the gender digital divide. The enrolment target in all programmes is 70% female. Two ICT Programmes are conducted under the Internet Training Centre Programme supported by a number of International and Local institutions as well as private companies including: Cisco Systems Inc., the United Nations Development Programme (UNDP), United States Agency for International Development (USAID), The United Nations Volunteers, and The International Telecommunications Union (ITU), among others. - <i>Internet Training Centre Programme:</i> The Internet Training Centre Programme Consists of two courses offered by the Department of Women and Gender Studies Local Academy namely Certified Cisco Networking Associate (CCNA) and Information Technology Essentials (IT Essentials I and II). The Certified CISCO Networking Associate Course is an internationally recognized course. The CCNA course offers a solid foundation in computer networking. CCNA certified professionals can install, configure and operate various types of computer networks. The course has four semesters covered in a minimum period of six months. We have the morning, afternoon and evening classes. IT Essentials I covers PC hardware and software and is an in-depth study of computer hardware and operating systems. Students learn the functionality of hardware and software components as well as suggested best practices in maintenance and safety. Through hands on activities and labs, students learn how to assemble and configure a computer, install operating systems and software as well as troubleshoot hardware and software problems. IT Essentials provides a foundation for students preparing to take the CompuTIA's A+ certification.
Outputs	Gender focused training programmes, research and research publications, outreach programmes, networking opportunities, gender mainstreaming initiatives

Intended outcomes, effect	Gender mainstreaming practices in S&T
Evaluation	N/A
Sources/references	http://womenstudies.mak.ac.ug/

89. Association of Women Engineers, Technicians and Scientists in Uganda (WETSU)	
Country/region	Uganda
Level of intervention	National
Who is driving it?	Academia, industry
Sector focus	SET general
Target group	Women engineers, technicians and scientists in Uganda; school girls
Type of initiative	Non-profit organisation/Association: Participation – specifically in education in engineering, science and technology
Description of initiative	The Association of Women Engineers, Technicians and Scientists in Uganda is a Non-Governmental, non-profit making Organisation that was formed by a group of women in 1989 to increase the number of women in Engineering, Science and Technology after realizing very low numbers in these fields. The mission of WETSU is to promote girls' and women's participation in engineering, scientific and technological education and work to enhance development and uplift the status of women in Uganda. Membership is open to women engineers, women technicians and women scientists.
Activities	<p>WETSU's activities include the following:</p> <ul style="list-style-type: none"> - <i>Career Guidance & Counseling / Role Modeling</i>: This is an on going activity where WETSU members travel to various parts of the country to meet students, parents and community leaders, talk and promote careers in scientific and technological disciplines. - <i>Production of a Documentary film</i> (sponsored by UNESCO) depicting women engineers, women technicians and women scientists at work. This is used as a tool and has been widely distributed within the country to schools and communities. Within the organisation, we have also seen the benefits of role modeling; women who were technicians pursuing further studies to read for degrees in engineering. - <i>Science laboratories</i>: This is a pilot project, which was started in a girl's secondary school. WETSU spearheaded the collaboration, which was aimed at building and equipping a science laboratory. The laboratory is to enable students in the school as well as in neighbouring schools (which share the lab) to improve their performance in science subjects. WETSU facilitated in raising funds for the building and obtained a donation of lab equipment from the Ministry of Education. The building is now roofed waiting further funding for completion. - <i>PAWETS Seminar</i>: In 1992, WETSU under the sponsorship of UNESCO hosted the Pan African Women Engineers, Technicians and Scientists (PAWETS) Seminar in Kampala, where PAWETS was launched. - <i>WETSU Directory</i>: Among the recommendations from PAWETS was the production of directory-listing women in these fields in the region. This project was hampered by lack of funds. However, in 1997, WETSU, which is a member of Uganda Women's Network (UWONET) began a joint collaboration with UWONET on an expanded Directory to cover women professionals in Uganda. This Directory has been published and will be updated regularly. - <i>The Science Award</i> : This is an award, which is given to the best-performing female student in each region of the country in the science subjects at Ordinary Level, where the choice for science

	<p>combinations is made. It is planned to extend to the Primary and Advanced school levels for earlier and further encouragement, respectively.</p> <ul style="list-style-type: none"> - <i>GAB Africa Region Secretariat:</i> WETSU is currently hosting the Gender Advisory Board (GAB) Africa Region Secretariat. The purpose of the secretariat is to enable the GAB fulfill its mandate in liaising with regional policy makers, researchers, NGOs, UN agencies and all stakeholders; and support national governments in implementing the United Nations Commission on Science and Technology for Development (UNCSTD) gender recommendations. The ultimate goal of this project is to improve the quality of life of women and men, girls and boys in the Africa region through promotion of women's participation in Gender, Science and Technology (G, S & T) for sustainable development. The project will increase collaborative regional activity in developing strategies to implement these recommendations by creating national Ad hoc committees that will review national priority areas of concern in Gender, Science and Technology and formulate national action plans. It will build capacity in the understanding, application and use of Information and Communication Technologies by women in the region and a regional web site and database will be created to facilitate further collaboration, information sharing and dissemination.
Outputs	<ul style="list-style-type: none"> - Career guidance/counseling and role modeling - Documentary film depicting women engineers, women technicians and women scientists at work - Fully equipped and accessible science laboratories - Seminars - Directory – listing women professionals in Uganda
Intended outcomes, effect	Increase in the number of women in Engineering, Science and Technology
Evaluation	N/A
Sources/references	http://www.wougnet.org/cms/index.php?option=com_comprofiler&task=userProfile&user=159&Itemid=65

GHANA

90. Science clinics	
Country/region	Ghana
Level of intervention	School level
Who is driving it?	Public service: Ghana Education Service
Sector focus	Science and Maths general
Target group	School girls – primary and secondary school
Type of initiative	Summer school: Access and participation for girls in science and maths education
Description of initiative	<p>In 1987, only one in 11 children at secondary school in Ghana was a girl - a figure that finally encouraged the country's government to do something about the educational gender imbalance endemic to many African countries. That year saw the inauguration of a new kind of "summer school" - the Science and Maths Education Clinic. One hundred and 10 female students enrolled in the first year. The ratio is down to one girl to three boys taking science and maths at secondary level. In the early years, girls were picked from secondary schools based on their performance, teacher recommendations and their commitment to a science-based career. But in 1990, this was widened to include primary school girls who had yet to settle on a final choice of subjects to counter a tendency of some girls to change courses midway through their education because of the length of time it took to qualify for some jobs, such as doctoring.</p>
Activities	The mode of instruction included hands-on activity, good illustrative materials, interaction with female role models, and excursions to places of scientific interest.

Outputs	Regional clinics
Intended outcomes, effect	Increase in the number of school girls choosing science and maths as subjects and careers and excelling in these disciplines.
Evaluation	<p>Since 1987 Ghana's female students have excelled.</p> <p>The retention rate for girls in science from primary to university has risen considerably and performance is higher.</p> <p>Most university campuses in Ghana now have a science clinic alumni network that support each other, and these girls are also supported to pursue courses otherwise considered unorthodox for women.</p> <p>Meanwhile the 2000 convocation at the University of Ghana saw the three top prizes in medicine go to women - all of whom were coincidentally alumni of the science clinics.</p> <p>In 1997, out of 52 graduate doctors at the Ghana Medical School, 15 were women - and they took 16 of the 21 academic prizes up for grabs.</p> <p>Indeed, the project has been so successful that now some fear boys are being alienated - and so for the first time high performing boys who can have access to sponsorships will be allowed to take part in the clinics.</p>
Sources/references	Internet news articles: http://www.otumfuo-charityfoundation.org/content/foundation-organises-maths-and-science-clinic-girls-0 ; http://news.bbc.co.uk/2/hi/africa/3052504.stm

SOUTH AFRICA

91. South African Association of Women Graduates (SAAWG)	
Country/region	SA
Level of intervention	National, across institutions
Who is driving it?	Academia
Sector focus	HE
Target group	Female undergraduate and postgraduate students
Type of initiative	NPO/Association – Funding mechanism: Participation – HE studies
Description of initiative	<p>The SAAWG offers a funding mechanism to promote women's participation in higher education studies. SAAWG is affiliated to the International Federation of University Women (IFUW) and is a founder member of the Federation of the University Women of Africa (FUWA). Within South Africa SAAWG is unique as the only group of graduate women of many disciplines. Its constitution has always laid down that it is a totally non-racial and non-party political organisation. Their commitment to provide funding forms part of the international organisation's Study and Action Programme, which is carried out by each member association. Each branch also has bursaries that are offered to women in their geographical area.</p> <p><i>Mission:</i> In conjunction with IFUW and FUWA, the focus of SAAWG is graduate women for whom the Association offers a unique opportunity for networking, and for using the knowledge and skills gained from their tertiary education for the betterment of other women. The Association is committed to improving the status</p>

	<p>of women and girls, furthering the development of education, protecting human rights and promoting world peace through education and international friendship.</p> <p><i>Aims:</i></p> <ul style="list-style-type: none"> - To promote understanding and friendship among all women graduates in South Africa, and through membership of the International Federation of University Women (IFUW) among women graduates throughout the world, irrespective of race, nationality, religion or political opinions - To represent women graduates in South Africa and to act on their behalf - To encourage the application of their knowledge and skills in the solving of problems that arise at all levels of public life whether local, national, regional or worldwide, and where appropriate through the International Federation of University Women - To further the development of education and its dissemination among all people in South Africa - To promote co-operation between the Association and other national, provincial or local organisations.
Activities	<p>SAAWG offers the following <i>Postgraduate Awards (Masters and Higher)</i>:</p> <ul style="list-style-type: none"> - Mary Agar Pocock Award - postgraduate study in Botany and related studies - Bertha Stoneman Award - Botany and related studies, including environmental studies - Esie Smuts Award - postgraduate study in any field - SAAWG Fellowship International Award - for a foreign student enrolled with a South African University for at least one year for postgraduate research - Undergraduate and Student Aid Awards are administered by the universities and technikons - Hansi Pollak Scholarship - postgraduate research directed towards bettering social conditions in South Africa. The recipient is required to spend at least two years in South Africa after completing the degree, implementing the results of the research. - Joan Whitmore Scholarship - postgraduate study or research in the broad field of engineering at a university or technikon. Applicants must show evidence of the relevance of their study or research to the development of South Africa, and of their community service. This scholarship is administered by the University of Pretoria.
Outputs	<p>Awards and bursaries</p> <p>Annual SAAWG Journal</p>
Intended outcomes, effect	Increase in women's participation in higher education studies.
Evaluation	N/A
Sources/references	http://www.ifuw.org/southafrica

92. Higher Education Resource Services South Africa (HERS-SA Project)	
Country/region	SA
Level of intervention	National, cross institutional
Who is driving it?	Academia: Cape HE Consortium
Sector focus	HE focus
Target group	Women in HE in SA (especially leadership positions)
Type of initiative	NPO/Network: Access to HE and decision-making and senior positions
Description of initiative	HERS-SA is a self-sustaining non-profit organisation, dedicated to the

	<p>advancement of women in the Higher Education sector. For the past eight years this small organisation has advocated for, and contributed to, the career development of women employed in academia via carefully crafted interventions including hosting the first national conference on Women in Leadership in Higher Education and the annually HERS-SA Academy that attracts women from all over sub-Saharan Africa. HERS-SA has grown from HERS Mid-America, which has been running professional development activities for women in higher education in the United States since 1975. Ongoing contact and co-operation has grown in both directions with women going to the USA and vice versa. Inspired by the American HERS programme and with the initial support of the Andrew W Mellon Foundation, HERS-SA began offering professional development programmes for academic and administrative women in South Africa in 2000. HERS-SA is now fully self-sustaining. Over 900 women from South Africa and other countries across Africa have participated in HERS-SA programmes. From 2003 to date The Carnegie Corporation of New York has provided funding for delegates from their higher education institutions partners in Southern African to attend the annual HERS-SA ACADEMY in South Africa.</p> <p>HERS-SA aims to:</p> <ul style="list-style-type: none"> - To develop and offer accessible education, training and development programmes for women working in the higher education environment - To empower women to take leadership positions in higher education institutions in South Africa, thereby providing much needed leadership role models for women - To challenge institutional culture and facilitate workplace change, thereby addressing gender inequity and enabling women to participate fully in the workforce.
Activities	<p>Current and Planning Activities include:</p> <ul style="list-style-type: none"> - The annual <i>HERS-SA ACADEMY</i> which is a week-long interactive professional development opportunity for women employed in higher education throughout Southern Africa. It is aimed at those women in, or aspiring to, senior leadership positions and typically attracts about 80 women. - The annual three-and-a-half day <i>HERS-SA mini-ACADEMY</i> has been designed to provide a series of highly interactive workshops to build the critical skills of women working in higher education. The mini-ACADEMY will also provide invaluable networking opportunities with other women in higher education as well as access to role models. Applications to attend this event are only open to HERS-SA alumnae who have previously attended the HERS-SA ACADEMY or HERS programmes in the USA. - Maintaining a flow of information between women in higher education (website and listserve) and facilitating structured mentoring. - Circulating information about development opportunities and jobs in higher education. - Facilitating networking between women in higher education institutions. - Research into and advocacy for gender equity in higher education in Africa.
Outputs	<ul style="list-style-type: none"> - Professional development workshops for women in HE in Southern Africa. - Structured mentoring - Information sharing – website and listserve

	<ul style="list-style-type: none"> - Networking opportunities between HE institutions - Research reports on gender equity in HE in Africa - Funding for professional development for women in HE
Intended outcomes, effect	<ul style="list-style-type: none"> - Improved status of women working in general in higher education, and in particular women in leadership positions - Accessible education, training and development programmes for women working in HE environment - More women taking leadership positions in HE institutions in SA - Decrease in gender inequity in HE institutions
Evaluation	List of accomplishments available on website
Sources/references	http://www.hers-sa.org.za

93. Thuthuka Programme	
Country/region	SA
Level of intervention	National
Who is driving it?	Public service: NRF
Sector focus	SET in HE
Target group	Women, blacks and individuals from previously disadvantaged institutions
Type of initiative	Funding: Access, professional development, productivity
Description of initiative	<p>The Thuthuka Programme's role can be seen as:</p> <ul style="list-style-type: none"> - Building of individual capacity of women, blacks and individuals from disadvantaged institutions. This will contribute directly to the skills and competencies needed for S&T development - Addressing the skewed staff distribution at HE institutions - Building the pool of post-graduates in order to supply the needs of the academic labour market - Assisting in identifying, and mobilizing resources that will eliminate barriers which had and adverse impact on designated groups - Developing highly qualified researchers who in turn will be involved in the training of researchers from the designated group through targeted capacity building interventions. <p>The strategic objectives of the programme are to:</p> <ul style="list-style-type: none"> - Improvement of the qualifications of the designated research group to doctoral and postdoctoral levels - Accelerate the progression of the designated research group into the mainstream of competitive national and other research support opportunities - Contribute to the sustainable research capacity development of the designated research group - Increase the number of NRF rated researchers from the designated research group in research national and internationally.
Activities	<p>This programme currently represents the most noteworthy funding for women in SET. The NRF is the funding agency for the parliamentary core grant and the Research and Innovation Support Agency (RISA) is the business unit within the NRF responsible for the administration of the grant. This is done via research and other grants for activities within the nine focus areas and is called Focus Area Programme funding. The funding is made available by means of:</p> <ul style="list-style-type: none"> - Researchers submit proposals within the Focus Area Programme and successful applicants receive up to a maximum of three two-year cycle of funding - Rated researchers submit proposals within the Focus Area Programme and successful applicants receive up to five years of funding.

	<p>Postgraduate students and final year non-white undergraduate students, who assist existing grant-holders in research, may access Focus Area Programme funding via the research capacity development programmes for individuals.</p> <p>The sub programmes must fulfill the mandate in terms of the promotion and support of research development and research capacity building, in particular with regard to formally disadvantaged groups and individuals, such as women, blacks and individuals at Historically Disadvantaged Institutions. These programmes must assist in strategically positioning these individuals in the research, development and innovation arena, as critical players in the National System of Innovation.</p> <p>The three sub-programmes are:</p> <p><i>Researchers-in-Training (RiT)</i>: The purpose of RiT is to develop entry-level researcher into a level where they can participate in other funding streams with established researchers on a competitive basis.</p> <p><i>Women-in-Research (WiR)</i>: The aim of this programme is to support women researchers in the development of their research careers, to establish them to become representative and contribute to research discourses. This is achieved by contributing towards: staff development of these women in obtaining postdoctoral research experience; the development of these women in the training of students; the development of these women in obtaining and becoming established researchers and the development of these women to obtain a NRF rating. The programme intends to serve individual women who have experienced career advancement limitations as it recognizes that women are still significantly under-represented in almost all fields of science, in spite of advances made on the education front to raise this proportion. There is the acknowledgement that although this group holds doctorates, they may not hold a rating, as their careers may have been interrupted due to the responsibilities that typically fall to women like child rearing or care of elderly or the relocation of a partner.</p> <p><i>REDIBA Research Development Initiative for Black Academics (REDIBA)</i>: The purpose of REDIBA is to prepare black SA researchers for positions of scientific and academic leadership, thereby diversifying, strengthening and sustaining the nation's research capacities. The objectives of this sub-programme is to:</p> <ul style="list-style-type: none"> - Contribute towards development of these researchers in obtaining postdoctoral research experience - Contribute towards the development of these researchers in the training of students - Contribute towards the development of these researchers in becoming established researchers
Outputs	<ul style="list-style-type: none"> - Increase the number of the designated research group with a post-doctoral qualification - Accelerate the development of the designated research group through a continuum of support to become NRF rated researchers - Increased commitment from institutions to develop the designated

	<p>research group</p> <ul style="list-style-type: none"> - Leverage additional research support/sources of funding and research support systems - Contribute to the development of a national plan for research support for the designated research group - Develop research capacity of the designated research group - Raise the profile of the designated research group in the research arena - Identify and develop partnerships with HE institutions
Intended outcomes, effect	<ul style="list-style-type: none"> - Increased number of the designated group with a post-doctoral qualification - Increased number of the designated research group becoming NRF rated researchers - Increased number of access to grants from other sources by the designated research group - Increased investment by institutions in the development of RCD of the designated research group - Increased level of funding and use of research support systems - National Plan for the research support to the designated research group - Increased number of the NRF rated researchers in the research nationally and internationally - Increased partnerships with institutions - Institutional changes that will overcome barriers that face the designated research group
Evaluation	N/A
Sources/references	http://www.nrf.ac.za/thuthuka/

93a. Women-in-Research (W-i-R)	
Country/region	South Africa
Level of intervention	National
Who is driving it?	Public service: Thuthuka Programme National Research Foundation, SA
Sector focus	SET in general
Target group	Women researchers in South Africa – especially black women
Type of initiative	Government programme: Participation, development, access to senior positions
Description of initiative	<p>The WiR endeavours to support women, especially black women, to develop and strengthen their research skills, and to increase the number of women in postgraduate studies, academia, research and in leadership positions at South African tertiary and research institutions. W-i-R was established in 1996 as a project within the Research Capacity Development (RCD) directorate of the then Centre for Science Development (CSD). W-i-R seeks to stimulate discussion on, and address, key issues that affect women researchers. Of particular concern is the serious under- representation of women among senior researchers, heads of departments, senior management and among those who access resources from funding agencies and organisations. The under-representation of women in the research community has resulted in their limited participation in national discourses and research agendas. As such, W-i-R aims to:</p> <ul style="list-style-type: none"> - Support women, especially black women, to develop and strengthen their research skills - Increase the number of women in postgraduate studies, academia, research and in leadership positions at South African tertiary and research institutions. <p>The main objectives of W-i-R are to:</p>

	<ul style="list-style-type: none"> - Gather and disseminate data and information on women researchers and their work environment at South African tertiary institutions - Encourage and facilitate networks and partnerships among women researchers at local, national and international levels - Facilitate the exchange of information and ideas on research and development - Lobby, with other partners, for policies and strategies that enable women to participate actively in the research domain - Monitor the impact of relevant national and institutional policies on funding and other research opportunities for women.
Activities	<p>The following form the core of W-i-R activities:</p> <ul style="list-style-type: none"> - Conceptualizing and implementing strategic interventions that are in line with the recommendations of the Women-in-Research Audit - Supporting and commissioning research, which may include investigations into the factors that inhibit or promote women's advancement in research, academia and leadership - Facilitating partnerships: W-i-R works in partnership with individuals, organisations, institutions and other constituencies who are interested in achieving increased representation of Women-in-Research production and management - Fostering collaboration: W-i-R fosters collaboration between early career researchers, post-graduate students and established women researchers. This includes efforts to design and implement a mentorship programme that would draw both less and more experienced women researchers and academics into research capacity development activities. A report is available which outlines the proceedings of a national workshop hosted by the Women in Research programme in February 2000. The workshop was attended by women academics and researchers in the higher education system and was intended to generate discussion and feedback on a draft proposal for the establishment of a national mentorship programme for women researchers - Soliciting applications from women researchers for NRF funding - Facilitating the establishment of networks and information exchange: <ul style="list-style-type: none"> - W-i-R promotes open and active communication amongst women researchers in the hope that this will also facilitate the establishment of regional networks - Supporting the development of gender-aware curricula: W-i-R supports the development of curricula that reflect the experiences of women and men within the different disciplines by the providing support to gender studies initiatives at South African universities - Workshops, seminars, and conferences: - W-i-R facilitates and holds workshops, seminars and conferences on issues pertinent to the objectives of the project - Database of women scholars in South Africa: The database of women scholars in South Africa is a tool through which the Women-in-Research project of the National Research Foundation hopes to facilitate networking and research collaboration among women researchers across all disciplines. The database can be searched by name, institution, and discipline or research interests.
Outputs	<ul style="list-style-type: none"> - Strategic interventions that are in line with the recommendations of the Women-in-Research Audit - Research into the factors that inhibit or promote women's advancement in research, academia and leadership - Partnerships being established - Mentorship programme that link less and more experienced women researchers and academics into research capacity development - Workshops, seminars, conferences - Assistance to women researchers applying for NRF funding - Networking and information exchange - Support to gender studies initiatives at SA HE institutions - Database of women scholars in SA
Intended outcomes, effect	<ul style="list-style-type: none"> - Women, especially black women, strengthening their research skills - Increase in the number of women in postgraduate studies, academia, research and in leadership positions at South African tertiary and research institutions

	<ul style="list-style-type: none"> - Collection of information on women researchers and their work environment at SA tertiary institutions - Increase in networks and partnerships among women researchers at local, national and international levels - Policies and strategies that enable women to participate actively in the research domain
Evaluation	N/A
Sources/references	http://www.nrf.ac.za/wir/

94. FAWESA professional development programme (Forum for African Women Educationalists South Africa)	
Country/region	SA
Level of intervention	National, institutional
Who is driving it?	Academia: Based at UCT SA
Sector focus	HE
Target group	Women in universities in SA Female educationalists, policy-makers, researchers and practitioners
Type of initiative	NPO/Forum: Policy development, gender equity – training and access, professional development
Description of initiative	<p>FAWESA's primary objective is to bring together female educationalists, policy-makers, researchers, and practitioners to provide gender equity in education and training through addressing policy-making and implementation in education at all levels. FAWESA co-ordinates programmes for the professional development of women in higher education. The Forum for African Women Educationalist South Africa (FAWESA) is a South African Chapter of the Forum for African Women Educationalist (FAWE), a partnership of African women cabinet ministers, vice-chancellors of universities, and other senior women policy makers, who assume leadership for education planning and implementation in their countries. FAWESA was formally launched in March 1997 with the primary objective of bringing together female educationalists, policy-makers, researchers, and practitioners to provide gender equity in education and training through addressing policy-making and implementation in education at all levels. FAWESA's specific objectives are:</p> <ul style="list-style-type: none"> - To stimulate governments, donors, and NGOs to increase their investment in education, especially in a manner that can accelerate the education of girls and women - To promote women's leadership and public policy-making skills within education through targeted capacity-building programmes - To gather existing data to design high-impact programmes, taking into account the special needs of female students and teachers - To reinvigorate politically the "Education for All" (EFA) goals by emphasizing that fully two-thirds of eligible school children who miss out on education in Africa are females - To build public awareness through media of the social and economic advantages of sending girls to school - To help NGOs expand their support for female education.
Activities	<p>FAWESA, together with different partners, offers two programmes for the professional development of women in senior positions in universities.</p> <p><i>Women's Executive Development Programme (WEXDEV) (Australia-South Africa Links Programme):</i> The Women's Executive Development Programme (WEXDEV)</p>

	<p>is a joint project between Peninsula Technikon (Pentech) and the University of Technology, Sydney (UTS) in partnership with the Forum for African Women Educationalists South Africa (FAWESA) and Australian Technology Network (ATN). The programme focuses on the career development of senior women on the academic and general staffs in South African Universities and Technikons. The general aim of the programme is to provide opportunities for women in higher education in SA to enhance professional capabilities in planning and administration so that they can successfully fill senior positions. More specific aims are:</p> <ul style="list-style-type: none"> - To establish a training and support network amongst senior women managers in higher education in SA - To develop training modules, mentoring programmes and experiential activities to provide professional development in economic policy, planning and administration in higher education - To establish links for cross-cultural research and development by senior women in higher education institutions. <p>The programme comprises a variety of activities such as seminars, workshops and inter-institutional visits.</p> <p><i>Professional Development Programme for Women in Higher Education Leadership (PROFDEV) (funded by the Ford Foundation):</i> The three-day residential core component of the programme aimed to facilitate women in their career planning by increasing self-knowledge and self-awareness via introspective activities and peer engagement. Knowing oneself in context enables the participant to position herself where she will be able to add most value to her own career development, to the career development of others, and the development of her institution.</p>
Outputs	<ul style="list-style-type: none"> - Women's Executive Development Programme focussing on the career planning and development of senior women in HE institutions - A training and support network amongst senior women managers in HE - Mentoring and training in economic policy, planning and administration in HE - Links for cross-cultural research and development by senior women in HE institutions - Seminars, workshops and inter-institutional visits
Intended outcomes, effect	<ul style="list-style-type: none"> - Governments, donors, and NGOs increased investment in education, especially in a manner that can accelerate the education of girls and women - Women's leadership and public policy-making skills improved - Enhanced professional capabilities in planning and administration of women enabling them to fill senior positions in HE - Increased awareness of the social and economic advantages of sending girls to school - Established training and support network amongst senior women managers in HE in SA
Evaluation	N/A
Sources/references	http://web.uct.ac.za/org/fawesa/index.htm

95. THRIP - Technology and Human Resources for Industry Programme

Country/region	SA
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Level of intervention	National – policy and implementation
Who is driving it?	THRIP is run as a programme from within the National Research Foundation (NRF) on a management service provision arrangement with the Department of Trade and Industry (DTI), defined in a Memorandum of Agreement, signed between the Director General of the DTI and President of the NRF. The NRF takes management, administrative and fiduciary accountability for the programme. The THRIP Board is an advisory body, providing strategic advice and guidance to the DTI Director General and NRF President. It is constituted of persons of senior leadership drawn from private sector, academia, government and labour, appointed jointly by the Director General and President.
Sector focus	R&D general
Target group	Industry Highly-skilled research and technology managers Students in S&T and HE institutions
Type of initiative	Government funding programme: Increased access to S&T studies, professional development and training
Description of initiative	<p>THRIP's mission is to improve the competitiveness of South African industry by supporting research and technology development activities and enhancing the quality and quantity of appropriately skilled people. THRIP is a partnership programme which challenges companies to match government funding for innovative research and development in South Africa.</p> <p><i>Aims:</i></p> <ul style="list-style-type: none"> - To provide South African industry with the means to obtain specific responses to its technology needs - To produce a flow of highly-skilled researchers and technology managers who understand research, technology development and the diffusion of technology from the viewpoints of both industry and academia - To provide a new and enhanced educational experience within the context of technology development and/or diffusion, through participation by students in collaborative projects - The programme is also designed to foster collaboration among industry, the higher education sector and government Science, Engineering and Technology Institutions (SETIs) as a means of contributing to the removal of past inhibitions to joint activity among these three sectors. <p><i>Objectives:</i></p> <ul style="list-style-type: none"> - To increase the number and quality of people with appropriate skills in the development and management of technology for industry - To promote increased interaction among researchers and technology managers in industry, higher education and SETIs, with the aim of developing skills for the commercial exploitation of Science and Technology. This should involve, in particular, promoting the mobility of trained people among these factors - To stimulate industry and government to increase their investment in research and technology development, technology diffusion and the promotion of innovation. <p><i>Priorities:</i></p>

	<ul style="list-style-type: none"> - To support an increase in the number of black and female students who intend to pursue technological and engineering careers - To promote technological know-how within the Small, Medium and Micro Enterprise (SMME) sector, through the deployment of skills vested in HEIs and SETIs - To facilitate and support the enhancement of the competitiveness of black economic empowerment and black owned enterprises (BEEs) through technology and human resource development - To facilitate and support multi-firm projects in which firms collaborate and share in the project outcomes, provided that one of the industrial partners involved, is a BEE.
Activities	<p>The services offered by THRIP mainly entail:</p> <ul style="list-style-type: none"> - Packaging the programme offerings - Calling for research proposals that meet the criteria - Evaluating the proposals and selecting those to be supported, using specialist panels - Disbursing the approved funds according to cash flow controlled by the industrial partners - Monitoring performance in terms of financial management, student training, technology development and technology transfer
Outputs	<ul style="list-style-type: none"> - Partnership agreements funding innovative R&D in SA - Collaboration among industry, HE sector and government SET - Deployment of skills in HE and SET sectors within SMME sector - Support of multi-firm projects - Selection, management and monitoring of funding for innovative R&D projects
Intended outcomes, effect	<ul style="list-style-type: none"> - Improved competitiveness of SA industry by supporting R&D development activities - Increased collaboration among industry, HE sector and government SET institutions that will assist in the development of skills for the commercial exploitation of S&T - Increase in the number and quality of people with appropriate skills in the development and management of technology and industry - Industry and government increasing their investment in R&D, technology diffusions and the promotion of innovation - Increase in the number of black and female students who intend pursuing technological and engineering careers - The deployment of skills from the HEIs and SETIs that will promote technological know-how within SMME sector - The enhancement of the competitiveness of black economic empowerment and black owned enterprises through technology and human resource development
Evaluation	N/A
Sources/references	www.nrf.ac.za/thrip

96. The Carnegie Corporation of New York's International Development Programme (IDP) – Enhancing women's opportunities in HE	
Country/region	SA
Level of intervention	Institutional
Who is driving it?	Carnegie Corporation, HE
Sector focus	HE
Target group	Women in HE institutions
Type of initiative	International grant making foundation: Gender equality, professional development
Description of initiative	The Carnegie Corporation is a US based grant-making foundation that currently makes funds available to South Africa through the IDP. The programme makes funding available to address the shortage of resources at HE institutions and libraries in Africa, and to assist in the furthering of educational opportunities and

	<p>professional development of women in HE. The programme aims to provide ten years of sustained support and intervention to selected universities and libraries in sub-Saharan Africa. In response to the lack of resources available to higher education institutions and libraries in Africa, and for women to further their education, the Carnegie Corporation is currently involved in funding grants in three areas through the following programmes:</p> <ul style="list-style-type: none"> - Strengthening African universities - Enhancing women's opportunities in higher education - Revitalising selected African libraries. <p>The Corporation feels strongly that universities will only be able to promote gender equity if the leaders are committed to initiatives to encourage female students to enroll in HE institutions, and specifically so in fields in which women are under-represented. The Corporation endeavours to enhance opportunities for women to access higher education in South Africa in two ways: They have initiated a female scholarship programme run by the National Department of Education and; they have woven gender into their requests for proposals as a key criterion for selection of funding projects. These have resulted in three specific programmes, the latter of which includes a specific S&T focus. These are:</p> <ul style="list-style-type: none"> - ICT in Higher Education, based at University of the Western Cape, which has a specific gender component. In short, funds are being provided for a partnership with universities and technikons to research and disseminate the application of information and communication technologies (ICTs) to achieve quality and equity in higher education in South Africa. - National scholarships for undergraduate women, which are administered by the National Department of Education. - The University Science, Humanities and Engineering Partnerships in Africa programme at the University of Cape Town, which seeks to attract junior women faculty members from other institutions in the programme.
Activities	IDP offers support in the form of scholarships, career counseling, policy reviews, the establishment of conditions conducive to the admission and graduation of female students and for the professional development of women.
Outputs	Scholarships, career counseling, policy reviews, professional development opportunities
Intended outcomes, effect	<ul style="list-style-type: none"> - HE initiatives to encourage female students to enroll in HE institutions, and specifically so in fields in which women are under-represented - Establishment of conditions conducive to the admission and graduation of female students and for the professional development of women.
Evaluation	Not available online
Sources/references	Original website no longer accessible

97. Women in Science Awards (WISA)

Country/region	SA
Level of intervention	National
Who is driving it?	Public service: Department of Science and Technology, Government of SA
Sector focus	SET general
Target group	Women scientists in South Africa

Type of initiative	Government programme –Award scheme: Reward and recognition
Description of initiative	<p>The Department of Science and Technology (DST) has two major objectives in achieving gender equity. The first objective is to unlock the potential of South African Women to develop into distinguished scientists and thus stimulate women's interest and entry into traditionally male dominated areas of science. An increase in the number of women scientists would thus allow women to make a meaningful contribution to economic growth and an improvement in the quality of life of the general population and, women in particular. The second objective is to mainstream gender into all research agendas to ensure that women are viewed as potential end-users and / or beneficiaries with a resultant improvement in the quality of their lives and thus their communities. It is with these objectives in mind that the Department of Science and Technology has created recognition awards to celebrate "Women in Science". These awards seek to recognise the contribution of outstanding women in scientific research and the contribution that they make to economic growth and to the ultimate improvement in the quality of life of South Africans. Categories include:</p> <ul style="list-style-type: none"> - <i>Distinguished Woman Scientist Award</i>: This award is made to a female scientist for her outstanding scientific contribution to the advancement of science and building of the knowledge base within the fields of Natural Sciences or Engineering. - <i>Distinguished Scientist Award for contribution to the Improvement of the Quality of Life of Women</i>: This award is made to a scientist (male or female) for his/her outstanding scientific contribution to improvement in the quality of life of women. - <i>Best Emerging Young Woman Scientist Award</i>: A young female scientist gets honoured for her outstanding scientific contribution to the advancement of science and building of the knowledge base within the fields of Natural Science and Engineering. - <i>Two L'Oréal South Africa 2007 Fellowships for Women in Science</i>: Two fellowships are awarded in the field of Natural Sciences or Engineering. - <i>Women Scientist Fellowships</i>: Three awards are made to women who are currently involved in full-time post-graduate study or research leading towards a PhD and who have two years post masters research experience. These awards will recognise outstanding ability and promise in research. Three grants are awarded as follows: <ul style="list-style-type: none"> - A postgraduate fellowship for Women Scientists from African Countries to study at centres of excellence in South Africa. Special consideration is given to applicants who show professional promise in innovative or neglected areas of research - A postgraduate fellowship for Women Scientists working / studying in an area where participation by women is traditionally low, e.g. maths, physics, astronomy, etc. - A post graduate fellowship for gender responsive research that impacts on the lives of girls and women in South Africa. The awardees may study in a country other than South Africa.
Activities	Funding awards, grants
Outputs	Awards and grants
Intended outcomes, effect	<ul style="list-style-type: none"> - South African Women developing into distinguished scientists - Women's interest stimulated and therefore entering into traditionally male dominated areas of science - Gender mainstreamed into all research agendas
Evaluation	N/A
Sources/references	http://www.dst.gov.za/other/wsa

98. Association of SA Women in Science & Engineering (SAWISE)	
Country/region	SA
Level of intervention	National, grass-roots
Who is driving it?	Industry
Sector focus	Science and Engineering
Target group	All those who support the idea of strengthening the role of women in science and engineering in SA Established women scientists and engineers Young people wishing to enter the fields of science and engineering
Type of initiative	Association: Access, participation and advancement
Description of initiative	A dynamic association for all those who support the idea of strengthening the role of women in science and engineering in SA. SAWISE aims to strengthen this role by inter alias: <ul style="list-style-type: none"> - raising the profile of women scientists and engineers - highlighting and addressing problems faced specifically by women in these fields - lobbying for the advancement of women in science and engineering - providing leadership and role models for young people wishing to enter the fields of science and engineering SA WISE is governed by a National Committee, but all members belong to specific branches in each of South Africa's 9 provinces. Each branch has its own Branch Committee.
Activities	An important function of SA WISE is to improve communication among women scientists and engineers, with e-mail being the preferred medium of communication. Members are encouraged to feed ideas and information in to SA WISE and a regular newsletter is circulated via e-mail to all members. (Postal services are used for members who do not have access to e-mail). SA WISE also maintains contact with other associations of women in science and engineering worldwide. Other activities include: <ul style="list-style-type: none"> - Gender statistics with respect to student ratios, employment numbers and funding allocations - Conferences, committees - Women in science road show – a series of presentation on the role and potential of women in science to schools and other interest groups. As well as traveling exhibit highlighting the contribution of SA and other women to science and engineering - Survey of attitudes: a survey of attitudes toward and of women in science and engineering - Shadow programme – exposing female high school students to short periods in their prospective job environments to assist with career choices - Career guidance – making women scientists and engineers available to assist at schools careers information events - Gender and professional identity workshops – training in confidence building in the predominantly male workplace
Outputs	<ul style="list-style-type: none"> - Information sharing and communication amongst women scientists and engineers - Gender statistics - Conferences, committees - Women in science road show highlighting the role and potential of women in science - Survey of attitudes - Career guidance

Intended outcomes, effect	<ul style="list-style-type: none"> - Gender and professional identity workshops - Raised profile of women scientists and engineers - Problems faced specifically by women in these fields highlighted and addressed - Lobbying for the advancement of women in science and engineering - Appropriate leadership and role models for young people wishing to enter the fields of science and engineering
Evaluation	N/A
Sources/references	http://www.sawise.org.za/

99. WOMEN in IT – SA	
Country/region	South Africa
Level of intervention	National level – industry focus
Who is driving it?	Industry & academia
Sector focus	IT
Target group	Women working within the IT sector and students pursuing career within IT
Type of initiative	Access and mentoring, skills development, advancement
Description of initiative	Women in IT is a bursary and mentorship programme that aims to create insight, opportunity, growth and development for women within the information technology sector. Headed by Microsoft and funded through corporate sponsorship, Women in IT creates formal and informal networks between women IT students, tertiary institutions, South African IT professionals and corporates.
Activities	<ul style="list-style-type: none"> - Bursaries - Mentoring programme (pairing and networking sessions and monitors relationship every three months) - Networking between IT students, tertiary institutions and IT professionals and corporates - Motivates for male mentors to also play their part
Outputs	<ul style="list-style-type: none"> - Mentoring relationships - Mentoring meetings and training - Networking opportunities - Bursaries - Quarterly newsletter - Website - Special events
Intended outcomes, effect	<p>Insight, opportunity, growth and development for women within the information technology sector.</p> <p>Platform for skills development and knowledge transfer.</p>
Evaluation	N/A
Sources/references	http://www.womeninit.co.za/forum.asp (website no longer active)

100. Women in Engineering Forum	
Country/region	South Africa
Level of intervention	Institutional
Who is driving it?	Academia
Sector focus	Engineering

Target group	Young girls, students
Type of initiative	Forum, support network
Description of initiative	<p>The Women in Engineering Forum (WIEF) has been established during 2003 at the Vaal University of Technology. The aim of the forum is to encourage and help create new engineers by instilling in young women an interest in the profession, and by passing along a lifelong zest for learning. The Forum is therefore implemented to act as a platform for social support networks for female students. The following endeavors will be undertaken:</p> <ul style="list-style-type: none"> • Industry - Involve as many women engineers currently working in industry, not only in managerial positions, but also on lower levels, as role models for female scholars and students. • Schools - To make all female scholars aware of the different fields available in engineering. (Visit schools in Gauteng and Free state); To assist female scholars to make the correct subject choices for their chosen field of interest in engineering. (Visit schools in Gauteng and Free state); To offer introductory lectures for interested female scholars that will help them decide on an engineering field of study. (Vaal University Of Technology); To enlighten parents in what their daughters can achieve in the engineering field and to get them involved in their daughters career choices. (Open days for parents during the introductory lectures); To offer special industrial tours with the help and assistance of interested industries. • Vaal University of Technology - To assist current female students enrolled in the field of engineering at the Vaal University Of Technology; To start an Engineering support group for female students at the Vaal University Of Technology; To make use of the female students at the Vaal University Of Technology as tutors for female learners doing Intro Engineering or the Foundation Course that will be implemented at a later stage; To offer special industrial tours with the help and assistance of interested industries. • Alumni/Diplomandi - Women graduates can share their experiences with female scholars and students
Activities	Regular meetings scheduled with students identify problems they experience during their studies and problem solving can take place. Regular guest speakers, and role models appear during these meetings. Tutors and mentors are allocated to interested parties.
Outputs	Meetings, networking opportunities, mentoring, tutoring, involvement of all stakeholder groups
Intended outcomes, effect	Encourage and help create new engineers by instilling in young women an interest in the profession, support to current students
Evaluation	N/A
Sources/references	http://www.vut.ac.za/new/index.php/women-in-engineering-forum

AUSTRALIA

101. Women in Science Enquiry Network (WISENET)	
Country/region	Australia
Level of intervention	National
Who is driving it?	Industry
Sector focus	SET general
Target group	Women and men in SET
Type of initiative	Non-profit organisation/Network: Networking, participation
Description of initiative	<p>WISENET was established to increase women's participation in the sciences and to link people in different branches of science and those working towards a more participatory and socially useful science. WISENET is open to women and men who are interested in the sciences and in working for change in line with the objectives. The objectives include:</p> <ul style="list-style-type: none"> - To increase women's participation at all levels in the sciences where they are now under-represented - To examine the education and employment structures which currently restrict women's opportunities in the sciences - To gather and disseminate data on women in science, the sciences here including physical, social and life sciences, mathematics, computing, medicine, engineering and associated technologies - To explore linkages between the different disciplines and promote communication between scientists and the community on social and environmental issues - To examine the relation between scientific research and technology and promote research and technology more appropriate to world needs - To explore programs for change in the sciences and more democratic and participatory systems as an alternative to the male-dominated tradition - To build an active network of people interested in these issues and to liaise with other interested groups - To support appropriate action to achieve these objectives
Activities	<p>WISENET activities include, for example:</p> <ul style="list-style-type: none"> - Special interest groups, such as that responsible for WISENET's special travelling exhibition on the history of women in science - Lobbying government and other authorities on issues significant to women in science - Holding local meetings with special lectures and arranging meetings with visiting scientists.
Outputs	<ul style="list-style-type: none"> - Lobbying activities - Meetings and networking - Pulling together interest groups
Intended outcomes, effect	<ul style="list-style-type: none"> - Increase women's participation at all levels in the sciences where they are now under-represented - Thorough understanding of the education and employment structures which restrict women's opportunities in the sciences - Data on women in physical, social and life sciences, mathematics, computing, medicine, engineering and associated technologies - Linkages between the various disciplines - Increased communication between scientists and other with other interested groups
Evaluation	N/A
Sources/references	http://www.wisenet-australia.org/

102. Women in Engineering (WIE)	
Country/region	Australia
Level of intervention	National
Who is driving it?	Industry, government, academia
Sector focus	Engineering
Target group	All girls and women interested in pursuing a career in engineering, women working in engineering, policy and decisionmakers
Type of initiative	Attract, retain, support, profiling – also policies and programmes, reward, networking
Description of initiative	<p>Women in Engineering is a special interest group of Engineers Australia. Our vision is that engineering is an inclusive profession which values, support and celebrates the contributions of women in the engineering team. Our objectives are to:</p> <ul style="list-style-type: none"> - Attract women of all ages to engineering careers - Retain women in engineering - Support women throughout their engineering careers - Celebrate the achievements of women in engineering
Activities	<p>The National Committee is made up from a representative from each of the Women in Engineering divisional committees plus a representative for each of the college boards. The role of the National Committee is to develop programmes and policies for women engineers at a national level. In 2010, an executive committee structure was developed to align with our strategic objectives for the year. This involved the allocation of portfolios and responsible coordinators. Women in Engineering's Portfolios are Professional Development, Scholarships, Policy, Promotions including website and Facebook, Attraction Programme and Awards.</p> <p><i>Professional Development</i></p> <ul style="list-style-type: none"> • <i>Leadership Skills for Professional Women:</i> Engineering Education Australia (EEA) offer a <i>Leadership Skills for Professional Women</i>. The one-day workshop is specifically tailored for women engineers with 5-10 years experience and is focussed on creating strategies for personal and professional leadership. In 2010, 72 women attended the course. For the past two years, the Victorian Women in Engineering Committee has offered a scholarship to attend this course. • <i>International Conference for Women Engineers and Scientists (ICWES15):</i> The event is co-hosted by Engineers Australia Women in Engineering and the International Network of Women Engineers and Scientists (INWES) and is the first time such an international conference has been held in Australia and the Southern Hemisphere. The themes of the conference are Leadership, Innovation and Sustainability. The conference will showcase the achievements of women and provide a platform to share innovative engineering, science and technological practices and projects. By showcasing such achievements and highlighting good industry practices, we aim to create an environment in which leadership can be used to better promote diversity. The conference also provides an exceptional opportunity to network with colleagues in business, academia and government. The three-day event held at the Adelaide Convention Centre is expected to attract a prospective audience of 400-500 delegates, from a diverse range of engineering, science and technology professions, practitioners, academia, industry and students from across the world. • <i>Supporting Members to Achieve Fellow Membership Status:</i> As part of the Women in Engineering National Committee's commitment to value, support and encourage the contributions of women to the engineering team, we are looking to support suitable members to achieve the

	<p>membership status of Fellow. Potentially eligible members for the grade of Fellow, based on the number of years of experience since graduation (15 or more) have been identified and an email sent encouraging them to express their interest in applying for the grade of Fellow.</p> <ul style="list-style-type: none"> • <i>Ongoing WIE Divisional Professional Development Activities:</i> In 2010, WIE division committees continued to organise relevant and interesting professional development events. Overall, approximately 75 events were held national wide, with over 1000 people attended. The events held by WIE division committees are closely aligned with the National Committee's vision to Attract, Retain, Support and Celebrate our members. Events vary from speaker seminars, workshops and school visits to networking functions. A range of event times from breakfast session and evening sessions to lunch time sessions were run to maximise the opportunity for members to attend. The work of our divisional WIE committee's in running these events has been a major contribution to the increase in female membership over the years. <p><i>Scholarship Program</i></p> <p>In 2010, the National Committee offered 6 scholarships to members to attend the Engineers Australia Leadership Conference in Brisbane in May. A total of 42 entrants applied for the scholarship prizes, which included one full conference registration with mentor and travel package, plus five \$500 subsidy scholarships towards attendance to the conference. All entrants were required to discuss their leadership and mentor relationships, and demonstrate how attendance at the conference would be of benefit to their career.</p> <p><i>Policy</i></p> <ul style="list-style-type: none"> - <i>Code of Ethics Review:</i> In response to Engineers Australia's Code of Ethics review, Women in Engineering National Committee submitted a response on-line supporting and encouraging the inclusion of diversity within the Code. The new Code specifically refers to diversity under the <i>Demonstrate Integrity and Exercise Leadership</i> clauses. - <i>Career Break Policy:</i> The WIE NC continued to encourage the promotion of Engineers Australia's Career Break policy to its members. <p><i>Promotion</i></p> <p>Throughout 2010, the National Committee continued to promote their members and the work of Women In Engineering.</p> <ul style="list-style-type: none"> - <i>Female Engineers Make it So Web Page:</i> The Women in Engineering (WIE) National Committee called on female engineers to be profiled in a special section of Engineers Australia's Make it So website dedicated to female engineers. The website goal is to continuously showcase female engineers and their great engineering achievements to help inspire others. An outstanding response was received and members are to be profiled on a rotational basis. - <i>Year of Engineering Leadership Profiles:</i> A number of members were put forward and profiled on the website and EA magazine as part of the Year of Engineering Leadership. - <i>Women in Engineering and Business Forum, Argentina</i> - <i>Equality Rights Alliance Member:</i> In 2010, WIE became a member of Equality Rights Alliance (previously WomenSpeak), which is a non-government network of over 50 diverse women's organisations and women's advocate groups across Australia. The Alliance is to support and strengthen diversity of women's voices advocating for gender quality and leadership. <p><i>Attraction Program</i></p>
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	<p>With the on-going success of the GirlTalk programme in Canberra, the National Committee is committed to continuously develop and improve the programme so that other divisions can implement it. The Tasmanian division recently produced a <i>Go Girl</i> brochure and is working with the National Committee to develop a template for the toolkit. Copies of the current CD were sent to all divisions for distribution at various career expos and fairs. Many of our members also attended and participated in the expos as volunteers, talking to students about their own personal journey and experiences. WIE also has member participation in various divisional school speaker programs.</p> <p><i>Awards</i></p> <p>This is a new portfolio for 2011. A number of objectives have been set for this portfolio in 2011 including: Develop criteria and nominate suitable members for the Engineers Medal; Develop a database of College awards and a list of potential nominations; Identify and nominate candidates for Honorary Fellow status</p>
Outputs	Attraction programmes, awards, web resources, information dissemination, policy recommendations, support and professional development workshops
Intended outcomes, effect	<ul style="list-style-type: none"> - Attract women of all ages to engineering careers - Retain women in engineering - Support women throughout their engineering careers - Celebrate the achievements of women in engineering
Evaluation	Various
Sources/references	http://www.engineersaustralia.org.au/women-engineering

INTERNATIONAL

103a. UNESCO – Women and Science – UNESCO Chairs “Women, Science, Technology and Development”	
Country/region	Argentina, Côte d’Ivoire, Brazil, Morocco, Burkina Faso, Khartoum Sudan, Pakistan
Level of intervention	National Institutional
Who is driving it?	UNESCO
Sector focus	S&T
Target group	Senior female scientists Women and teenage girls
Type of initiative	Advocacy – Gender equity Professional development
Description of initiative	<p>From the beginning, UNESCO has worked to “advance the ideal of equality of educational opportunity without regard to race, sex.” (UNESCO’s Constitution, Article 2 (b), 1945). The Organisation’s programme to promote women in science and technology is an ongoing part of the ideal. The Network of UNESCO Chairs “Women, Science, Technology and Development” was launched in July 2006. Its objectives are:</p> <ul style="list-style-type: none"> - To establish a scientific and technological, research and training programme with a gender equality perspective - To provide women and teenage girls with scientific and technology-based training in sustainable and participative management of resources (particularly water). <p>At present the network brings together seven UNESCO Chairs in Argentina, Côte d’Ivoire, Brazil, Morocco, Burkina Faso, Khartoum Sudan, and Pakistan. These university Chairs have several points in common: They are run by women; they promote women in the fields of science and technology through research and teaching programmes on gender in these fields; and training in the sustainable development management of resources (notably water) for women and teenage girls, principally in rural areas. The Chairs participating in this Network pool expertise in science, technology, development, water management and a gender equality objective. They establish among themselves a relationship of cooperation and solidarity.</p>
Activities	Placement and support of chairs in various universities
Outputs	Network of chairs that advocate and train across borders
Intended outcomes, effect	Equal access and gender equality in science training
Evaluation	Various reports available on specific chairs and regions
Sources/references	http://portal.unesco.org/science/en/ev.php-URL_ID=3597&URL_DO=DO_TOPIC&URL_SECTION=201.html

103b. L'OREAL-UNESCO For Women in Science	
Country/region	Africa and Arab States; Asia-Pacific; Europe; Latin America; and North America
Level of intervention	International, National and Regional
Who is driving it?	Industry and funding agency
Sector focus	Physical Sciences
Target group	Young and established female researchers – seen to be role models for future generations
Type of initiative	Award scheme, fellowship scheme, recognition and reward
Description of initiative	<p>Started as partnership between L'OREAL and UNESCO in 1998 to promote women in scientific research.</p> <p>The cornerstone is <i>the L'ORÉAL-UNESCO Awards</i>: annual distinctions awarded to five leading women researchers, one per continent, identifying exceptional women as role models for the generations to come. The Laureates, who work across the spectrum of the Physical Sciences, are chosen on the basis of their groundbreaking achievements and potential contributions to scientific progress. An international jury of 16 eminent members of the scientific community selects the L'ORÉAL-UNESCO Awards Laureates. Chosen in recognition of her exceptional achievements, one Award Laureate is named from each of five regions: Africa and Arab States; Asia-Pacific; Europe; Latin America; and North America. The Laureates receive individual awards of US\$100,000. Life Sciences and Physical Sciences are recognized in alternating years.</p> <p>In some rare cases, on a proposal put forward by the International Awards Jury, L'ORÉAL and UNESCO may award the lifetime achievement of an exceptional woman scientist, enhancing the model of this pioneer for the current and next generations of women researchers. Thus far, three women have been cited, in 2006, 2002 and 2000, for an <i>L'ORÉAL-UNESCO Tribute To a Life Achievement</i>.</p> <p>UNESCO-L'ORÉAL <i>International Fellowships</i>: Granted annually since 2000 to 15 promising young women scientists, doctorate or post-doctorate, they encourage international scientific cooperation and the developing of cross-cultural networks.</p> <p><i>L'Oreal National and Regional Fellowships</i> with the support of UNESCO National Commissions, which anchor the For Women in Science programme in countries around the world, while respecting their particularities and specific needs.</p> <p>AGORA: An interactive forum (blog), launched in 2006, and is published four times a year and aims to create and support dialogue between women in the scientific community. AGORA explores subjects such as Science education for girls and women, women's roles in sustainable development and Bioethics and women and science.</p>
Activities	Financial awards, fellowships (international, national and regional)

	Profiling and recognition Online blog
Outputs	Since 1998, 67 L'ORÉAL-UNESCO Award Laureates from 30 countries have been recognized for their careers and, through a programme of national, regional and international fellowships, over 1000 young women from 100 countries have been encouraged to pursue their scientific vocations. Thus nearly 1100 women scientists have been distinguished by the Awards or supported in the pursuit of their career since the creation of the L'OREAL-UNESCO partnership. Connecting and supporting dialogue between women in science.
Intended outcomes, effect	<ul style="list-style-type: none"> - Recognition and profiling of young and established female scientists across the continents - Financial reward - Financial support - Dialogue and support between women working in science.
Evaluation	Various reports on activities across countries and regions.
Sources/references	http://www.loreal.com/_en/_ww/for-women-in-science.aspx

104. Global Alliance for Diversifying the Science and Engineering Workforce

Country/region	In its initial development stages, the secretariat is located at two sites: the University of Washington in Seattle, Washington and AAAS offices in Washington, DC. In the future, the secretariat will have several international and regional offices.
Level of intervention	International, national, regional and institutional
Who is driving it?	<ul style="list-style-type: none"> • American Association for the Advancement of Science (AAAS); Women in Engineering Programs & Advocates Network (WEPAN); and the Association for Women in Science (AWIS). • Industry and various associations
Sector focus	Science, math, engineering and technology (SMET) workforce worldwide
Target group	Corporations, colleges and universities, governments, professional associations, non-governmental organisations
Type of initiative	<ul style="list-style-type: none"> • Diversification and representation • Increased participation of women in SMET • Awareness and profiling

Description of initiative	<p>The Global Alliance for Diversifying the Science and Engineering Workforce is a collaborative initiative of the American Association for the Advancement of Science (AAAS); Women in Engineering Programs & Advocates Network (WEPAN); and the Association for Women in Science (AWIS).</p> <p>Mission: To support efforts to diversify the global engineering and science workforce; to increase the role and participation of women in the science, math, engineering and technology (SMET) workforce worldwide; to support other areas of diversity, including social groups, ethnicity, age, discipline, languages, and cultures.</p> <p>Objectives: Establish worldwide collaborations with higher education institutions, corporations, non-governmental organisations and governments in order to support efforts to diversify the SMET workforce; and facilitate the development of long-term, sustainable infrastructures with a diverse SMET workforce.</p> <p>Strategic Goals:</p> <ul style="list-style-type: none"> • Develop networks of academic institutions, non-governmental organisations, corporations, international organisations, and governments working to diversify the SMET workforce • Identify and disseminate the latest best practice information on diversity measures worldwide • Develop common standards for data collection and conducting research on diversity in the SMET workforce • Showcase women scientists and engineers whose research relates to global science and technology issues • Build technical human capital in developing nations by providing cooperative education opportunities in sustainable development issues such as water and land use • Develop and provide training and seminars on mentoring curriculum to improve recruitment and retention of diverse groups in the workforce.
Activities	<p>Networks of academic institutions, non-governmental organisations, corporations, international organisations, and governments working to diversify the SMET workforce; information dissemination on the latest best practice information on diversity measures worldwide; standards for data collection and conducting research on diversity in the SMET workforce; cooperative education opportunities in sustainable development issues; training and seminars on mentoring curriculum to improve recruitment and retention of diverse groups in the workforce.</p>
Outputs	<p>Access to the Global Alliance website; links to international women's groups and other related organisations; current statistical data and analyses; conferences, often held in conjunction with member organisation's annual conferences; annual conferences in conjunction with AAAS and WEPAN; small forums held worldwide on topical issues; access to information and training on best practices in education, corporations, and government.</p>

Intended outcomes, effect	<ul style="list-style-type: none"> • Diversified global engineering and science workforce • Increased participation of women in SMET • Networks and collaboration between HE institutions, corporate, NGOs and governments all working to diversify the SMET workforce • Best practice information on diversity measures and HR practices • Research on diversity in SMET • Profiling women scientists
Evaluation	N/A
Sources/references	http://www.globalalliancesmet.org/

105. American Association for the Advancement of Science (AAAS) International Initiatives	
Country/region	Middle East, North Africa and United States of America
Level of intervention	International, national, regional
Who is driving it?	American Association for the Advancement of Science (AAAS) and various partners Associations, academia, industry
Sector focus	Science, technology and engineering
Target group	Women in STE
Type of initiative	<ul style="list-style-type: none"> • To increase participation • To promote and profile • STE network creation amongst women working in STE across continent
Description of initiative	AAAS International initiatives include efforts to increase and promote the role of women in science, technology, and engineering (STE). AAAS is currently seeking to improve STE networks between and among women in the Middle East and North Africa with similar networks in the United States. To increase and promote the role of women in STE careers and education, current AAAS international information resources include: international funding opportunities for women in STE; international STE partnerships between universities across continents, and profiles of women in STE in the Middle East and North Africa. AAAS also administered a travel grant programme called Women in International Science (WISC) from 2001 - 2003.
Activities	Information sharing, networking
Outputs	Information dissemination, networks of women in STE in the Middle East, North Africa and United States
Intended outcomes, effect	<ul style="list-style-type: none"> • Increased participation • Promotion • STE networks between and among women in the Middle East, North Africa and United States
Evaluation	N/A
Sources/references	http://www.aaas.org/programs/